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REDUCING
VIBRATION
AND NOISE

AND NOISE
VIBRATION
REDUCING



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Armstrong Cork & Insulation Company
Pittsburgh, Pa.

NONPAREIL CORK MACHINERY ISOLATION

for

Reducing the Noise and Vibration of Fans,
Motors, Printing Presses and
Machinery Generally

NONPAREIL

Reg. U. S. Pat. Off.

Armstrong Cork & Insulation Company
Pittsburgh, Pa., U. S. A.

Branches in the Principal Cities of the United States and Canada



—The trunk of an old oak tree, showing the knots and
the bark of the trunk.

Reducing Vibration and Noise

NOISE and vibration have long been recognized as undesirable, but little has been done in past years looking to their reduction or elimination, except in hospitals, apartment houses and hotels. Here the demand for quiet has been so insistent that sound-deadening measures have been imperative. Recent investigations, however, as to causes and remedies for industrial inefficiency have brought to light the fact that vibration and noise in manufacturing plants are quite objectionable factors from the standpoint of efficiency and economy.

Its Importance

Effects of Noise

Noise is fatiguing. To prove this statement it is only necessary for one who is unaccustomed to the terrific clatter of a boiler shop to stand near a riveting machine in action. In a very short time he will experience a decided sense of fatigue. Fatigue is a direct cause of carelessness, which, in turn, is responsible for a surprisingly large proportion of the accidents that occur daily in manufacturing plants. Furthermore, noise is responsible for the misunderstanding of orders and consequent errors; it increases nervous strain and makes for irritability and dissatisfaction; it diminishes efficiency and production; it distracts the attention of employes and makes it more difficult for them to concentrate on the task in hand. This has been noted many times among workers in offices, drafting rooms and the like. In almost every instance where they have been transferred from noisy to quiet locations, the quality and quantity of work have been increased greatly.

Accidents

Lowered Efficiency

Vibrations, aside from the fact that they cause most industrial noises, are also a constant menace not only to the machines themselves, but to the buildings that house them. Their continued action may weaken the structure and, in some instances, has even caused complete collapse.

Kinds of Vibrations

Space will not permit entering into an extended discussion of the characteristics of vibrations, but it is

Complex in Nature

necessary to know something about the way in which they are transmitted, before they can be counteracted effectually. Vibrations are usually quite complex in nature, due to the constant change in the direction of the moving parts that produce them. Generally speaking, however, the direction of vibrations will be approximately the same as the direction of their generators. That is to say, an engine or machine working horizontally will send out vibrations in a horizontal direction, and a vertical engine or machine will distribute its vibrations in a vertical direction.

Air Vibra- tions

Every machine, due to the impossibility of balancing its moving parts perfectly, sends out some vibrations. Part of these are given up directly to the surrounding air and are gradually dissipated without any very decided change in their direction. The elimination of noise resulting from such vibrations can be accomplished only by completely enclosing the machine so that no sound waves may escape.

Founda- tion Vi- brations

Other vibrations are transmitted through the machine to the floor, thence to the walls, and finally to the ground. Nor do they always stop there, for if the nature of the soil makes it a good conductor, these foundation vibrations are carried surprising distances and are frequently noticeable in surrounding buildings. Obviously, foundation vibrations in passing through the floor and walls are the adjacent air in motion. The more general use of such good sound conductors as steel and concrete in buildings naturally tends to increase the transmission of noise in this manner.

It was pointed out above that the only way to overcome these vibrations given directly to the air is by enclosing the machine so that the sound waves cannot escape. However, as foundation vibrations are the chief producers of noise, the operation of machinery will be rendered much more quiet if these vibrations can be suppressed.

Suppressing Vibrations

Two Methods

There are two ways by which this object may be accomplished. First, by anchoring the machine to a foundation too massive to be set in motion by the vi-

brations generated by its operation; second, by isolating the machinery—that is, by placing it upon a material of such structure that the vibrations will not readily pass through it, but will be absorbed.

The first method cannot generally be recommended, as it is necessary to build foundations much larger than are ordinarily required for the anchoring of machinery. Furthermore, mere size is not a guarantee that the vibrations will be suppressed, and large foundations may be set in motion by impulses apparently quite insignificant.

Necessary Requirements of Machinery Isolation

This, then, brings us to the alternative method, and a consideration of the proper isolating material to use in connection therewith. Obviously, any substance suitable for this purpose must be :

**Six
Essentials**

1. Resilient;
2. Permanently elastic;
3. Strong in structure;
4. Damp- and moisture-proof;
5. Easy to install;
6. Reasonable in price.

In cork we find a material well suited by nature for this purpose, and in the form of Nonpareil Cork Machinery Isolation it combines in a remarkable degree all the essential characteristics just enumerated.

Nonpareil Cork Machinery Isolation

Nonpareil Cork Machinery Isolation is composed of pure granulated cork compressed in metal molds and

What It Is



Nonpareil Cork Machinery Isolation

baked at a moderate temperature. The baking process brings out the natural waterproof gum or rosin of the cork, cementing the granules firmly together and making the use of any artificial binder unnecessary. After baking, each sheet is trimmed and sanded to insure uniform size and thickness. Nonpareil Cork Machinery Isolation is furnished in standard sheets of various thicknesses, densities and colors. (See Service Details, page 21.)

1. Resiliency

Cork

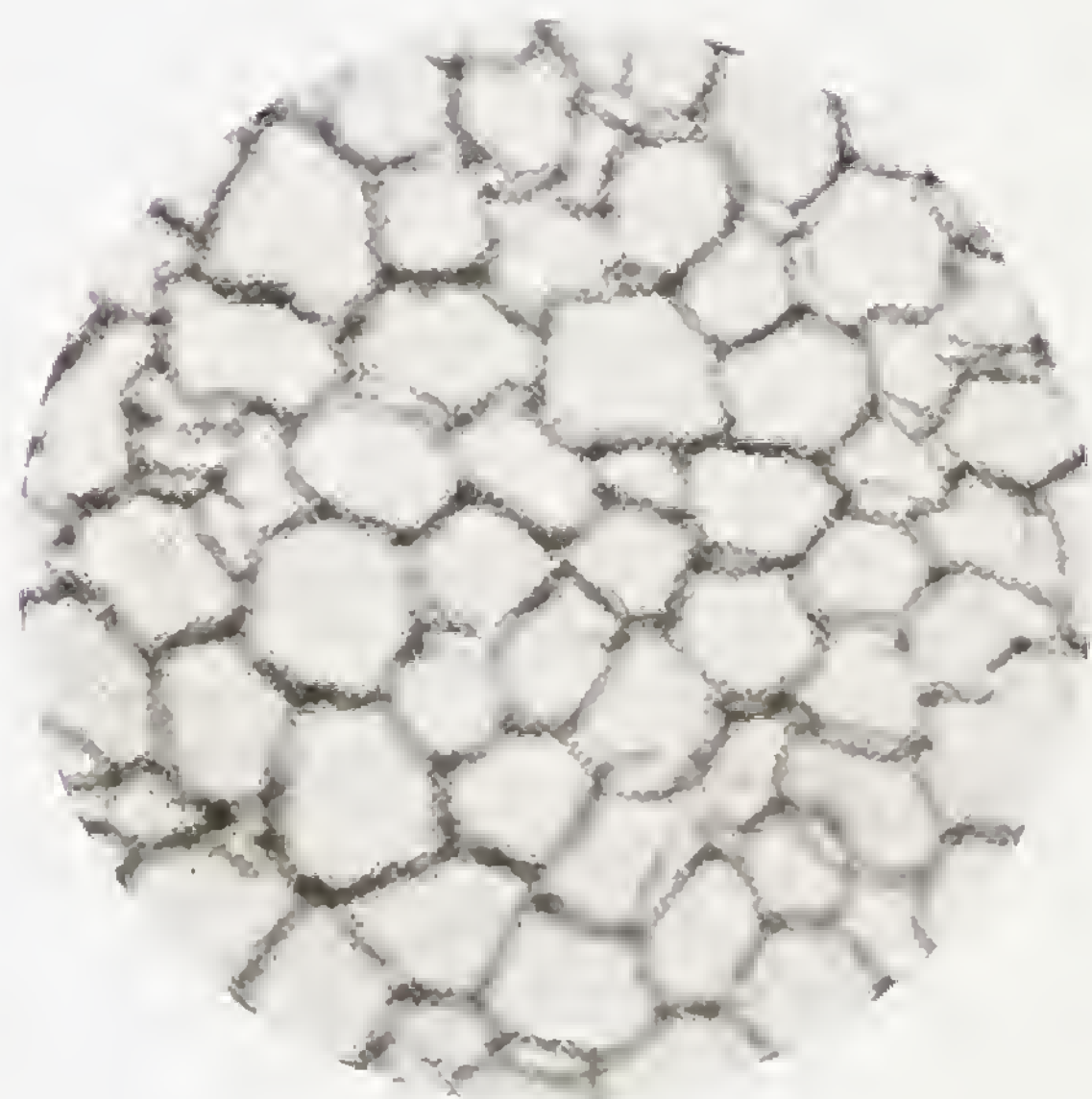
To a clear understanding of why Nonpareil Cork Machinery Isolation is sufficiently resilient for use as a vibration absorbent, it is necessary to know something of the nature of cork. If cork is examined under the micro-

scope, its structure will then be seen to consist of myriads of minute air-cells separated from each other by thin walls of tissue. Each of these microscopic cells contains a tiny bit of air, and each one is, moreover, sealed up tight and rendered impervious to moisture.

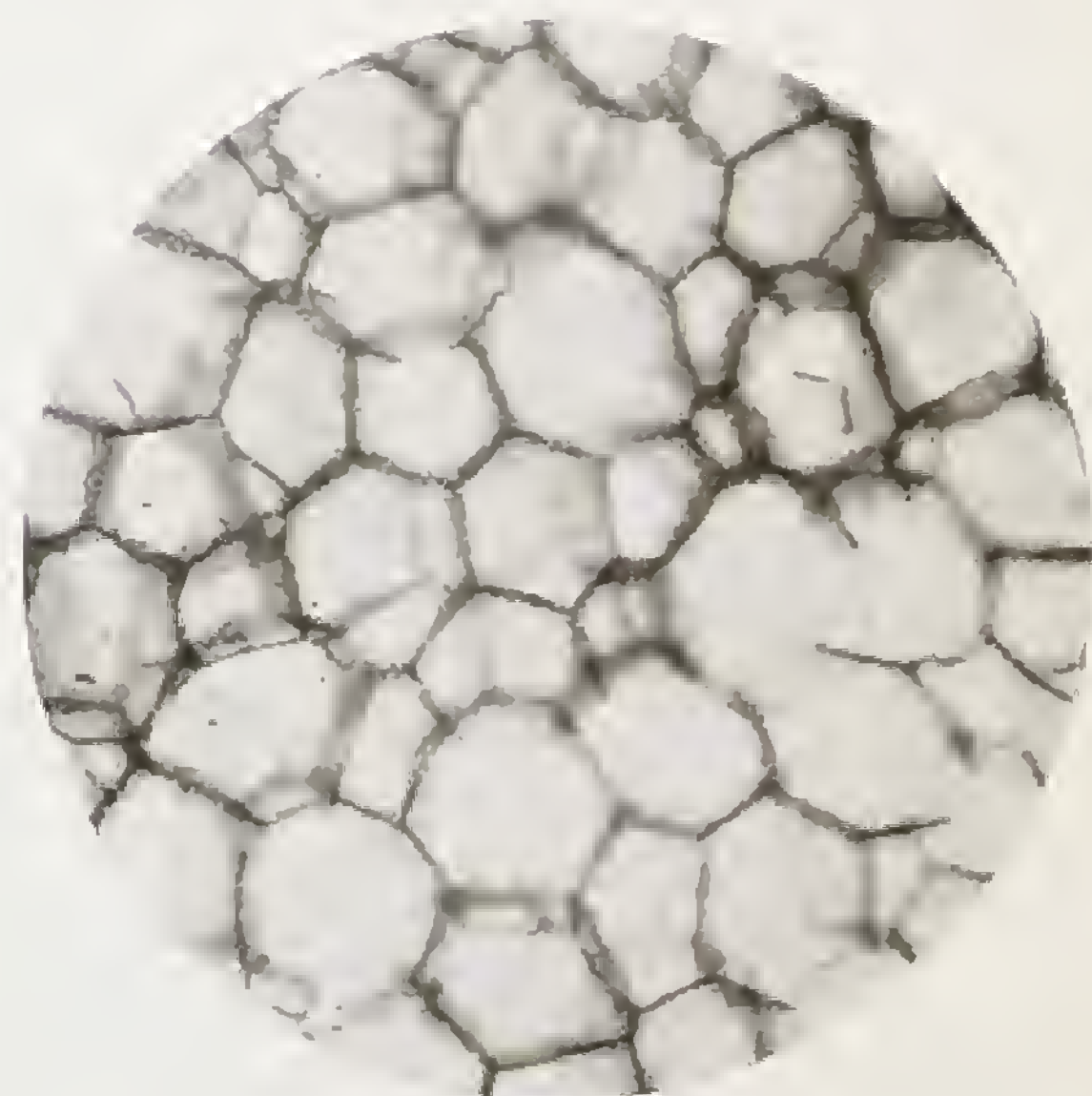
Thus it will be seen that the innumerable cells of the cork in reality form a large air

cushion that yields to practically every compression force exerted upon it. Furthermore, the air contained in these cells is confined in such small particles that they are not readily set in motion, and the vibration waves are gradually broken up instead of being transmitted to the adjacent supporting structure.

The cellular structure of the natural cork is not injured by the process employed in manufacturing Nonpareil



Cork under the microscope



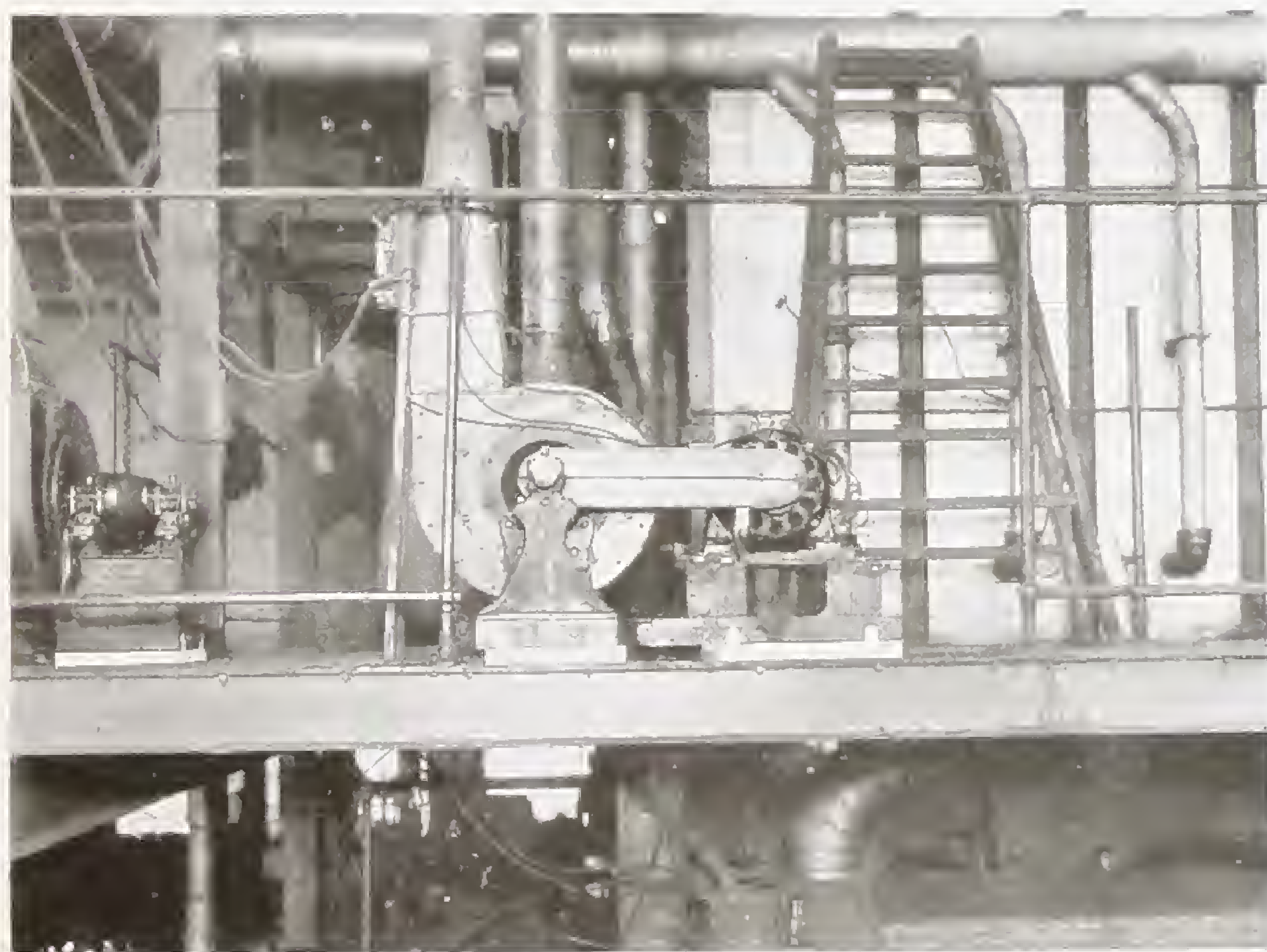
Nonpareil Cork Machinery Isolation under the microscope

Cork Machinery Isolation. This, an inspection of the finished product clearly shows. The pressure to which the granulated cork is subjected goes principally to fill up the voids between the granules, while the baking process actually increases the isolating efficiency of the raw material in two ways: First, by driving off the sap, thus increasing the volume of confined air; second, by coating the surface of each separate granule with a thin film of the natural waterproof gum, affording an effective barrier against the entrance of moisture. Any substance, naturally resilient, that became saturated with water, would lose its isolating quality and become a good conductor of vibrations.

2. Elasticity

Resiliency, however, is but the first requirement for a machinery isolating material. Elasticity—that quality which enables the material to return to its original shape and bulk after each compression, without taking a permanent set—is of almost equal importance. And here

Quite
Important



Motors and blowers isolated with Nonpareil Cork Machinery Isolation installed between the bed plate and the floor. The Nonpareil Cork is enclosed in telescoping pans

again it is the structure of the cork that imparts this quality to Nonpareil Cork Machinery Isolation.

Many materials, such as felt, shavings, hair, sawdust, sand, asphalt, etc., have proved unsatisfactory for isolating purposes, because the vibrations to which they are subjected gradually cause them to settle into a compact mass, thus transforming them into good conductors. Rubber has also proved ineffective, for it will harden in time. The tiny air-cells of the cork, on the other hand, will spring back to their original state under repeated variations of pressure, well-nigh indefinitely—provided the material has not been subjected to a load sufficient to break down the cell structure.

3. Structural Strength

Unless an isolating material has considerable structural strength it can only be used in connection with the very lightest machinery; the loads encountered under heavy units will break down its resistance and render it unfit for use in a very limited period.

A Series of Tests

To determine the suitability of Nonpareil Cork Machinery Isolation in this respect, a series of tests was made by the Pittsburgh Testing Laboratory, in March, 1914. The test pieces were eight inches square, and 1, 1½, 2, 3, 4 and 6 inches thick, respectively. Loads were applied to steel plates 4 inches square, laid on the sheets—not to the whole surface of the Nonpareil Cork. This was done so that the shearing action of the edges of the plates could be observed. Actual working conditions were thereby approximated, since in practice it is seldom that the bottoms of machinery bases present perfectly flat surfaces. The results of these tests follow:

Test No. 1

Nonpareil Cork Machinery Isolation—1 Inch Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.02			
800	7,200	.05			
1200	10,800	.08			
1600	14,400	.12			
2000	18,000	.16			
2400	21,600	.20	1/64		{ Slight fracture in cork
2800	25,200	.26			
3200	28,800	.29	1/32	1/32	Break in cork
3600	32,400	.32			
4000	36,000	.36	3/64		
4400	39,600	.39			
4800	43,200	.41	1/16	3/32	

Test No. 2

Nonpareil Cork Machinery Isolation—1½ Inches Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.03			
800	7,200	.07			
1200	10,800	.12			
1600	14,400	.16	1/32		
2000	18,000	.24			{ Slight fracture in cork
2400	21,600	.30	1/32		
2800	25,200	.34			
3200	28,800	.39	1/16	1/16	Break in cork
3600	32,400	.44			
4000	36,000	.48	1/16		
4400	39,600	.54			
4800	43,200	.57	1/16	1/8	

Test No. 3

Nonpareil Cork Machinery Isolation—2 Inches Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.04			
800	7,200	.08			
1200	10,800	.11			
1600	14,400	.16	1/64		{ Slight fracture in cork Break in cork
2000	18,000	.22			
2400	21,600	.28	3/64		
2800	25,200	.32			
3200	28,800	.40	3/64	1/16	
3600	32,400	.46			
4000	36,000	.51	1/16		
4400	39,600	.56			
4800	43,200	.64	1/16	1/8	

Test No. 4

Nonpareil Cork Machinery Isolation—3 Inches Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.04			
800	7,200	.08	1/32		
1200	10,800	.14			
1600	14,400	.22	1/16		
2000	18,000	.30			{ Slight fracture in cork Break in cork
2400	21,600	.38	1/16		
2800	25,200	.44			
3200	28,800	.50	3/32	3/32	
3600	32,400	.59			
4000	36,000	.68	3/32		{ Plate compressed into cork flush with top
4400	39,600	.76			
4800	43,200	.82	1/8	3/16	

Test No. 5

Nonpareil Cork Machinery Isolation—4 Inches Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.02			
800	7,200	.08			
1200	10,800	.14			
1600	14,400	.24	1/32		
2000	18,000	.34			
2400	21,600	.44	3/32		(Slight fracture in cork
2800	25,200	.52			
3200	28,800	.60	1/8	1/16	Break in cork
3600	32,400	.70			
4000	36,000	.82	3/16		Badly broken
4400	39,600	1.00			
4800	43,200	1.16	3/16	1/4	

Test No. 6

Nonpareil Cork Machinery Isolation—6 Inches Thick

Load in pounds applied on 4-inch square plate on top of cork	Load in pounds per square foot applied on plate	Compression of Nonpareil Cork Machinery Isolation, in inches	Contraction of Nonpareil Cork Machinery Isolation around top edge of sheet, due to compressing plate into the cork, in inches	Depth of depression of the plate in the Nonpareil Cork after the load was released, in inches	REMARKS
400	3,600	.05			
800	7,200	.10			
1200	10,800	.20			
1600	14,400	.26			
2000	18,000	.34			
2400	21,600	.44			
2800	25,200	.50			(Slight fracture in cork
3200	28,800	.62		1/16	Break in cork
3600	32,400	.73			
4000	36,000	.81	3/16		Cork broken
4400	38,600	.90			
4800	43,200	.98	5/32	3/16	

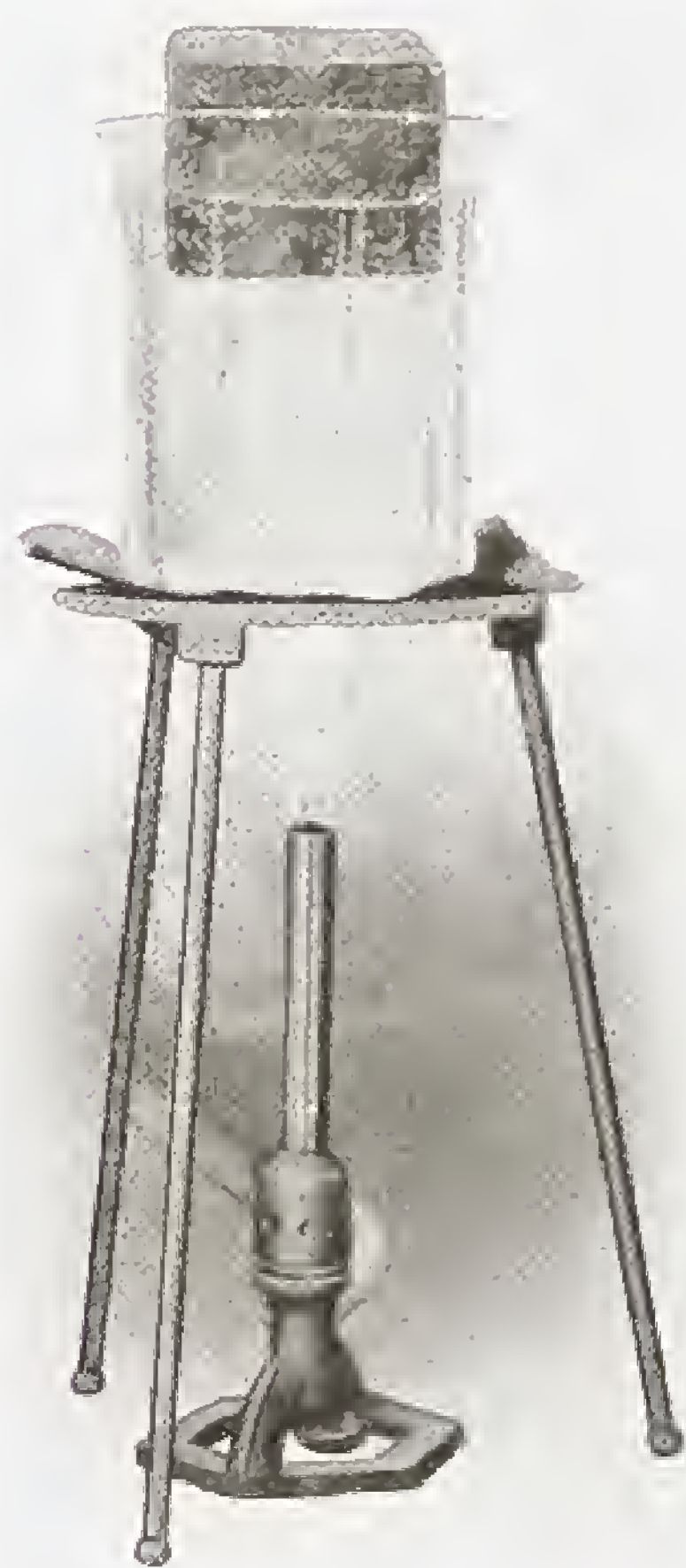
4. Imperviousness to Moisture

An
Important
Point

The ability to resist successfully the action of moisture is of two-fold importance in an isolating material. First, it makes for long life in service, and second, as was mentioned before, water is a good conductor of sound waves. Hence, any substance is practically worthless as an isolating material after it has become water-soaked.

An Inter-
esting
Experi-
ment

In describing the process of manufacture of Nonpareil Cork Machinery Isolation, it was pointed out that the granules are coated with the natural waterproof gum or rosin of the cork. Just how effective this coating is in resisting the entrance of moisture may be readily determined by the following simple test: Break a sam-



Boiling test on Nonpareil Cork
Machinery Isolation

ple of Nonpareil Cork Machinery Isolation in two and boil one piece for three hours. Weight it down, if you wish, so as to submerge it completely. Take it out, and you will find it still firm and none the worse for its experience. Now fit the two pieces together. See for yourself that the boiling water has caused little or no expansion. Then break open the granules of the boiled piece and you will find them dry inside.

This test is designed to concentrate in a short period of time those destructive forces to which all isolation might be subjected during its term of actual service. It demonstrates conclusively what experience has shown to be true, viz., that Nonpareil Cork Machinery Isolation, properly installed, will last almost indefinitely.

5. Easy to Install

The convenient board form of Nonpareil Cork Machinery Isolation makes it especially well suited for use

under all kinds of machines. It may be sawed or cut into the desired shape as readily as lumber, and where large pads are needed, they can be made in sections and cemented together. Nonpareil Cork Machinery Isolation can, almost without exception, be supplied in the desired thickness, eliminating the necessity of building up the material in layers. (See Service Details, page 21.)

**Made in
Sheets**

6. Reasonable in Cost

While not a cheap material, Nonpareil Cork Machinery Isolation is not expensive when its isolating qualities, durability and other merits are recognized. If, in addition, the comfort and efficiency which attend its use are taken into consideration, and the fact that only a small amount is generally required, the material will be found to be very reasonable in cost.

**A Paying
Invest-
ment**

Applications

The field of usefulness of Nonpareil Cork Machinery Isolation is almost unlimited. While not intended to



Isolating a mail conveyor base with Nonpareil Cork Machinery Isolation.
Pennsylvania Railroad Station, New York City



Applying Nonpareil Cork Machinery Isolation to motor stand.
Post Graduate Hospital, New York City

**Extensive
Applica-
tion**

be by any means exhaustive, the following list will indicate some of the many places where it can be used to special advantage :

Apartment Houses	Machine Shops
Clubs	Office Buildings
Grinding Rooms	Power Boats
Hospitals	Printing Plants
Hotels	Residences
Libraries	Steamships

Stamping Rooms

and in manufacturing establishments generally, for reducing the noise from

Air Compressors	Forging Machines
Blowers	Machine Tools
Drill Presses	Motors
Drop Hammers	Printing Presses
Elevator Hoists	Pumps
Engines	Punching Machines
Fans	Refrigerating Machines

Vacuum Cleaners, etc., etc.

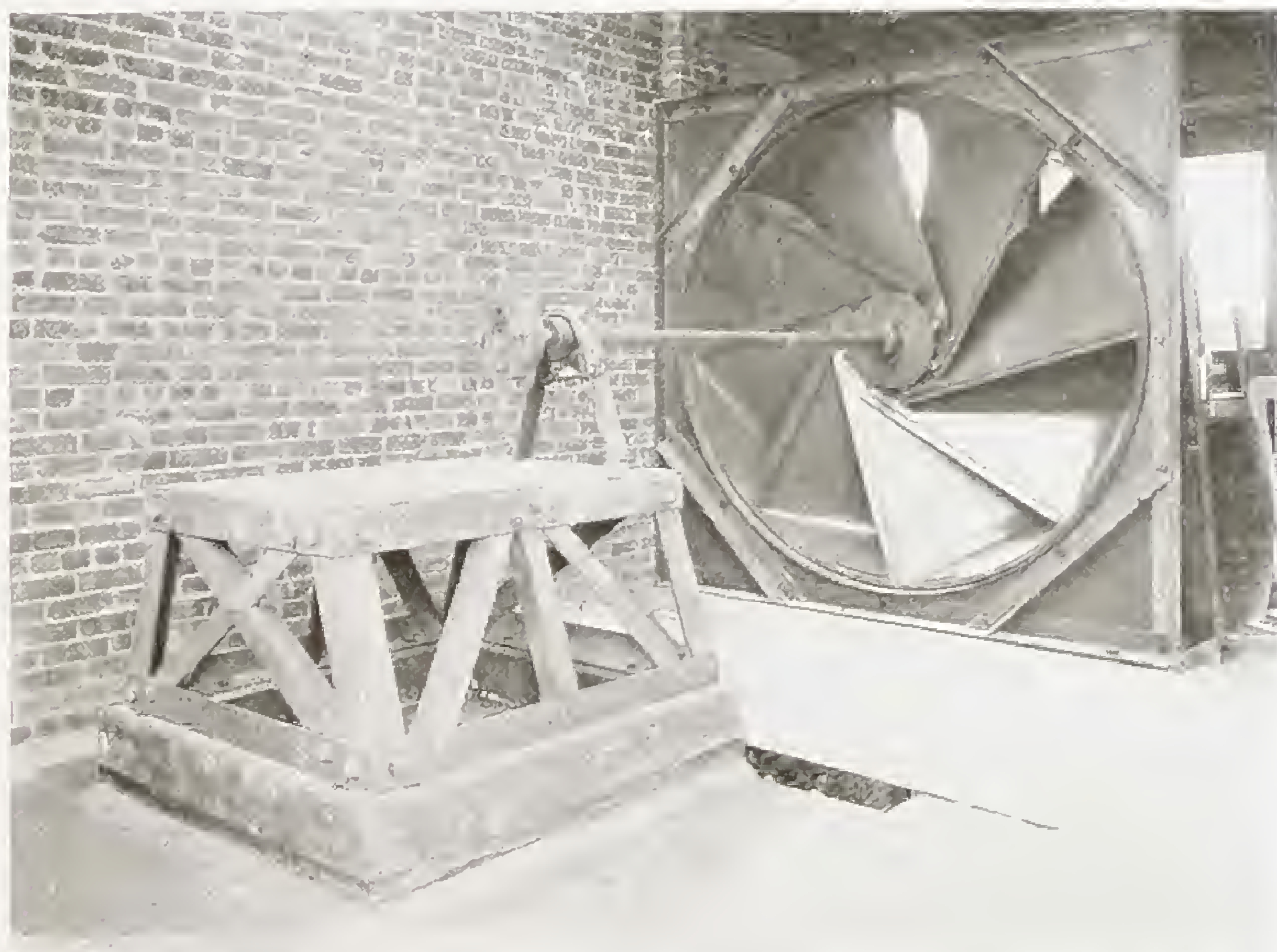
No doubt many other applications will suggest themselves at once to the architect or engineer who is interested in eliminating unnecessary vibration and noise.

In Hospitals, Apartments and Hotels

For many years Nonpareil Cork Machinery Isolation has been used successfully for absorbing the vibrations of fans, motors, refrigerating and other machines, in hospitals, clubs, apartment houses, etc., where quiet operation is absolutely necessary to the comfort of the occupants. Messrs. Howard & Morse, of New York City, have employed Nonpareil Cork quite successfully for this purpose, as is shown by the following letter, written April 6, 1911, by Mr. John Piercy, their engineer:

Messrs.
Howard
& Morse

"We use this cork under our fan frames and electric motor foundations to prevent sound transmission and have found it to be an excellent preventative for that purpose. It is mostly specified by the engineers under whom our installations are made, but we sometimes use it of our own volition.



Motor stand set in place on concrete foundation with the Nonpareil Cork Machinery Isolation between the wood base and the concrete. Post Graduate Hospital, New York City

“ We have used it in the
St. Regis Hotel, New York
Martinique Hotel
B. N. Duke Residence
Whitelaw Reid Residence
New Philosophy Building, Columbia
University
Institution of Musical Arts
Naval Branch, Y. M. C. A., Brooklyn
Phoenix Life Insurance Co., Hartford,
Conn.

and we are about to use it in the
Post Graduate Hospital
Knoedler Building
E. H. Gary Residence
American Geographical Society Building

“ Of the successful use of Nonpareil Cork
for this purpose, we cannot speak too highly.”

Girard
Trust
Company

Ducts for ventilating or other purposes are excellent
conductors of sound. Yet even when it is necessary to
place machines directly over them, the apparatus can be
isolated quite effectively with Nonpareil Cork Machinery
Isolation. The experience of Messrs. Dickerman &
Yeakley, Philadelphia, Pa., as outlined in their letter of
April 15, 1911, will be of interest in this connection:

“ Regarding the cork used for isolation in the
new bank building of the Girard Trust Company,
this city, would say, when the location of the ice
machine was decided upon, it was found to be over
one of the ventilating ducts, and to avoid the
possibility of vibration or sound being transmitted
from the machine to the building, we placed under
and around the foundation of the refrigerating
machine your Nonpareil Cork. The results were
satisfactory to all parties concerned.”

Bellevue-
Stratford
Hotel

The opinion of Mr. G. F. Shertenlieb, Chief En-
gineer, Bellevue-Stratford Hotel, Philadelphia, Pa., is also
of value. His letter of April 24, 1911, follows:

“ In reference to the [Nonpareil] cork used
under the ventilating fans to stop the vibration

and sound going through the building, I wish to say that we have never been annoyed by the operation of these fans and consider it a very satisfactory piece of work."

The Triumph Ice Machine Company, Cincinnati, Ohio, use Nonpareil Cork Machinery Isolation where the noiseless operation of their machines is required. Mr. J. B. Williams, Chief Engineer, in his letter of June 10, 1915, states clearly their opinion of the material:

**Triumph
Ice Ma-
chine
Company**

"Relative to results obtained by the use of your Nonpareil Machinery Isolation Cork, we beg to advise that we use it exclusively under machinery where the specifications call for absolutely noiseless operating machines, for hospitals, clubs, etc.

"Our experience has been with 2-inch thick material, and usually the entire concrete foundation has been isolated with it. This method prevents vibration being transmitted from the foundations to the building walls and floors, thereby eliminating all annoying sounds.

"The exceptional qualities of Machinery Isolation Cork, which include ability to withstand heavy loads for an indefinite period without crushing, and its convenient form for handling, make it an ideal material for use as designed by your engineering department."

In Printing Plants

The operation of printing plants always produces a great deal of vibration. If, as frequently happens, the presses are on the upper floors of buildings, the vibrations are felt throughout the structure. That Nonpareil Cork Machinery Isolation can be used to excellent advantage in plants of this kind is indicated in the following letter, written October 1, 1900, by Mr. William Van Wart, Superintendent Printing Department, New York Life Insurance Company, New York City:

**New York
Life
Insurance
Company**

"I wish to say that the cork composition which we put under our presses for deadening the

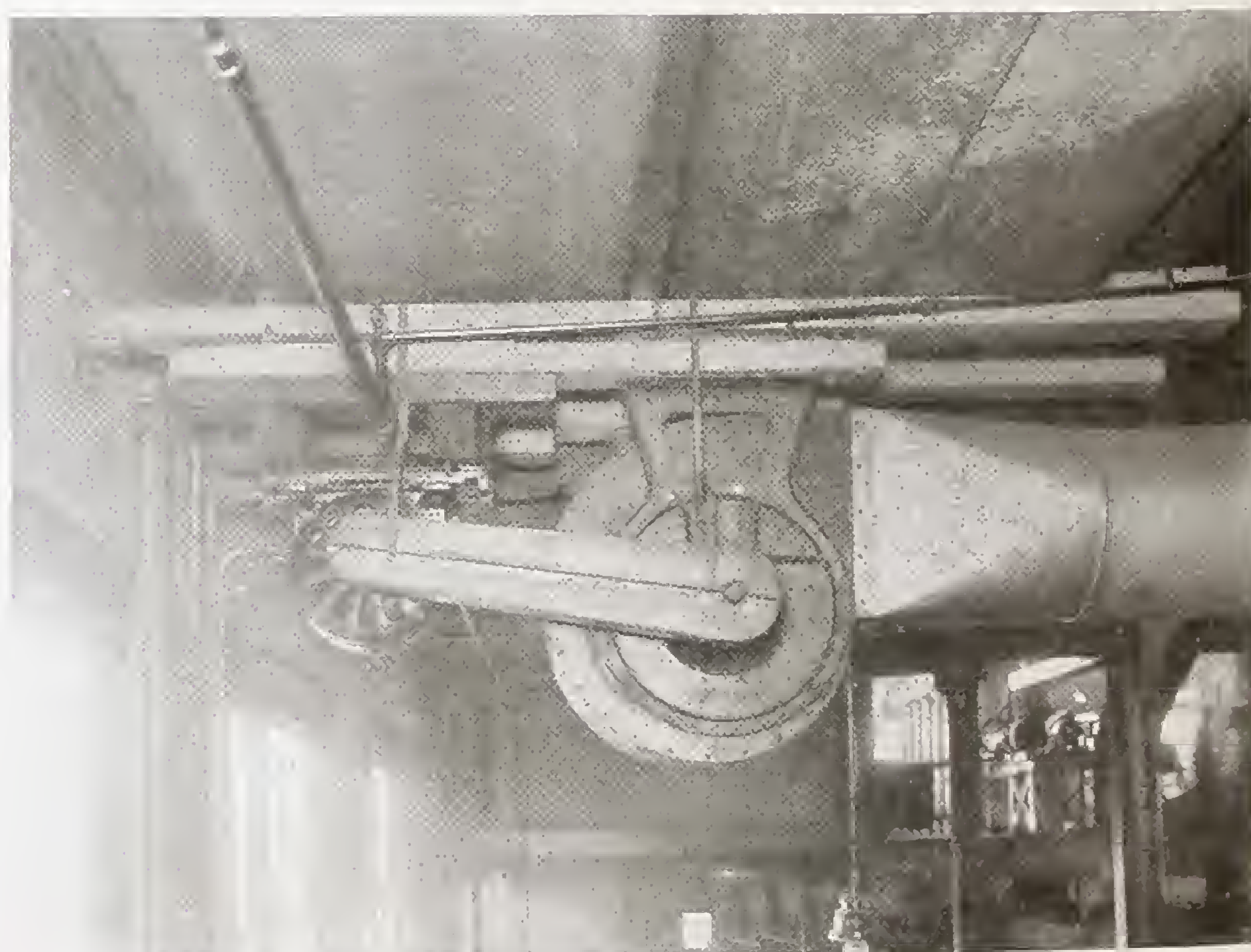
noise and lessening the vibration has proved entirely satisfactory and accomplishes the object for which we purchased it."

In Manufacturing Plants

Cincinnati Time Recorder Company

The field of usefulness for Nonpareil Cork Machinery Isolation in manufacturing plants is so large that an extended discussion of its application is out of the question. In fact, there is hardly a plant but has one or more machines producing vibrations that should be absorbed. Particularly is this true of those machines located near offices. Just what can be accomplished along these lines is pointed out in a letter dated April 11, 1915, from Mr. W. L. Campbell, Secretary and Treasurer, The Cincinnati Time Recorder Company, Cincinnati, Ohio:

"Relative to the results obtained by the use of your 2-inch thick Nonpareil Cork Machinery Isolation, would advise that we have a milling machine on the second floor directly over the writer's office, and when the vertical attachment



Motor and fan installed on concrete ceiling and cushioned with Nonpareil Cork Machinery Isolation placed between the wood footing and ceiling pieces

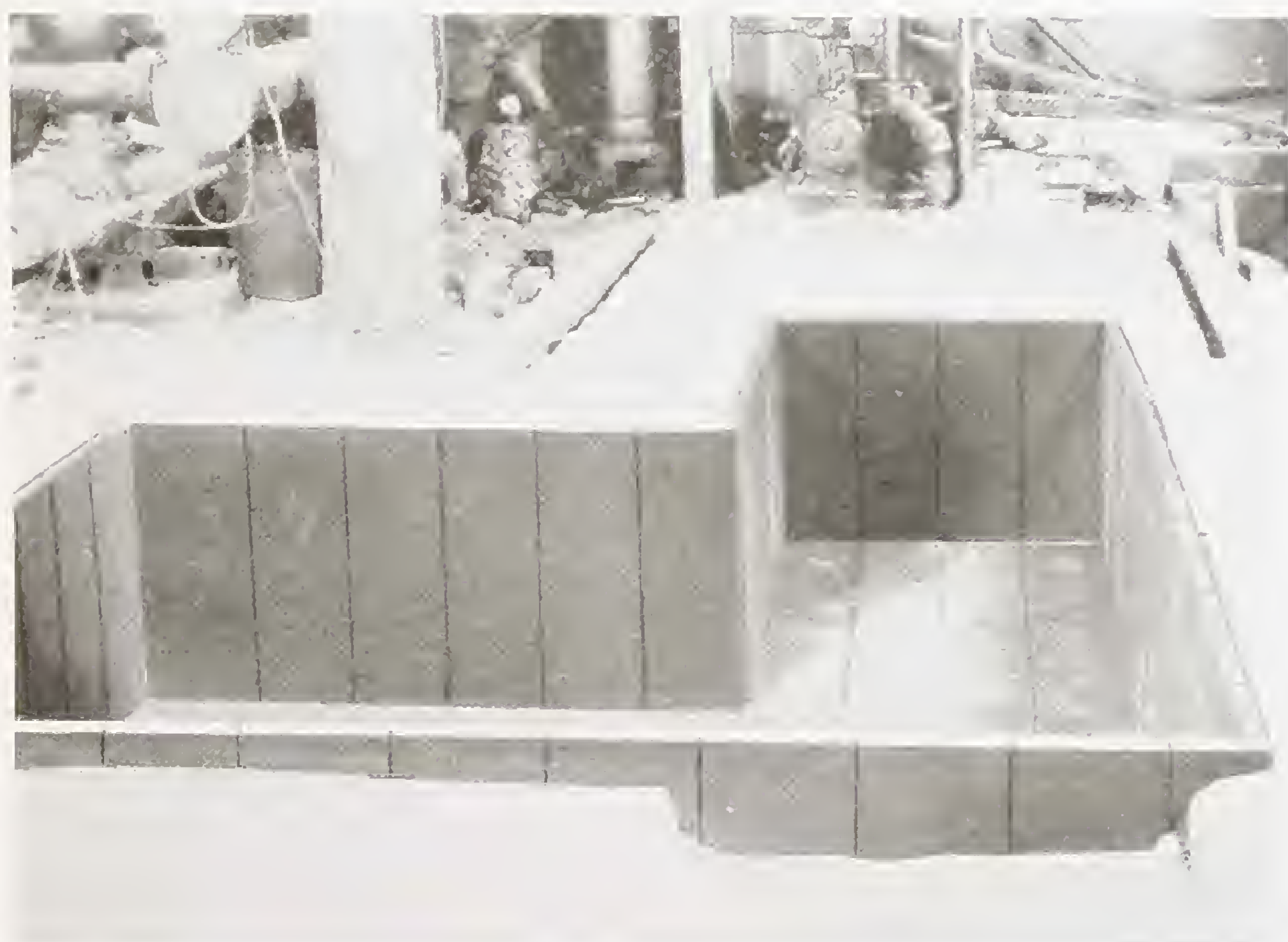
was used on this machine the noise was so great that it prevented satisfactory work below.

"Your 2-inch Nonpareil Cork Machinery Isolation was installed upon your recommendation, and we are pleased to inform you that the noise has now been reduced by about 75 per cent."

Service Details

Nonpareil Cork Machinery Isolation is manufactured in various densities and three shades of brown, to meet the different service conditions encountered. All grades and colors are produced in boards 12 inches wide, 36 inches long, and 1, 1½, 2, 3, 4, 5 and 6 inches thick.

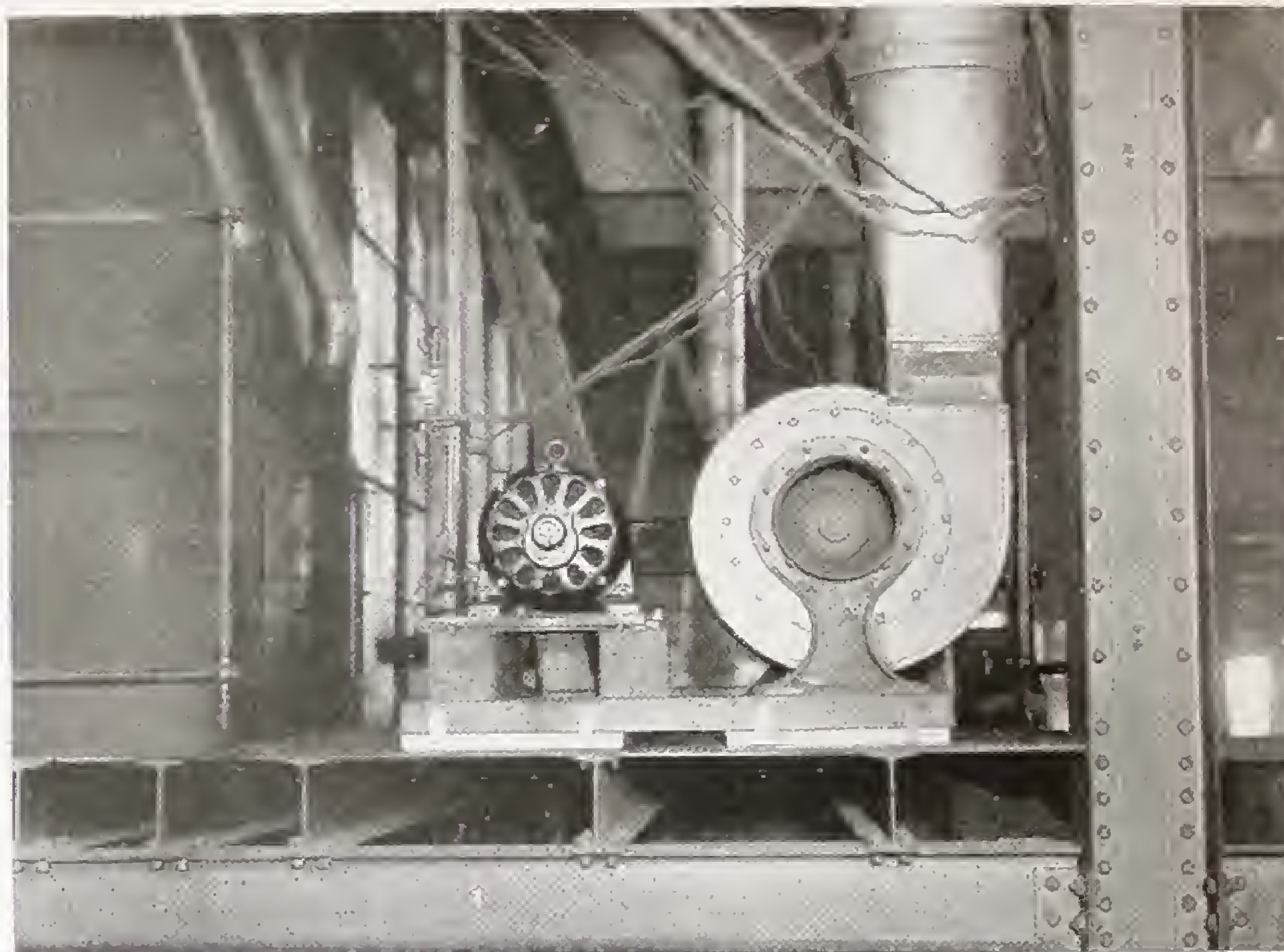
Board
Form



Foundation pit for oil engine, isolated with Nonpareil Cork Machinery Isolation on all sides and the bottom. Linz Building, Dallas, Tex.

The densities of Nonpareil Cork range from 1.10 pounds per board foot (12 x 12 x 1 inches) to 1.66 pounds per board foot. Densities from 1.10 pounds to 1.33 pounds are furnished in either light or medium color. The 1.50 and 1.66 pounds density stocks are furnished in three colors, viz., light, medium and dark. Light color is harder than medium color; medium color is harder than dark.

Densities
and
Colors



Motor and blower isolated with Nonpareil Cork Machinery Isolation installed between the bed plate and the steel floor. The Nonpareil Cork absorbs the vibrations so effectively that it is not necessary to anchor these machines to the floor

Kind of Material to Use

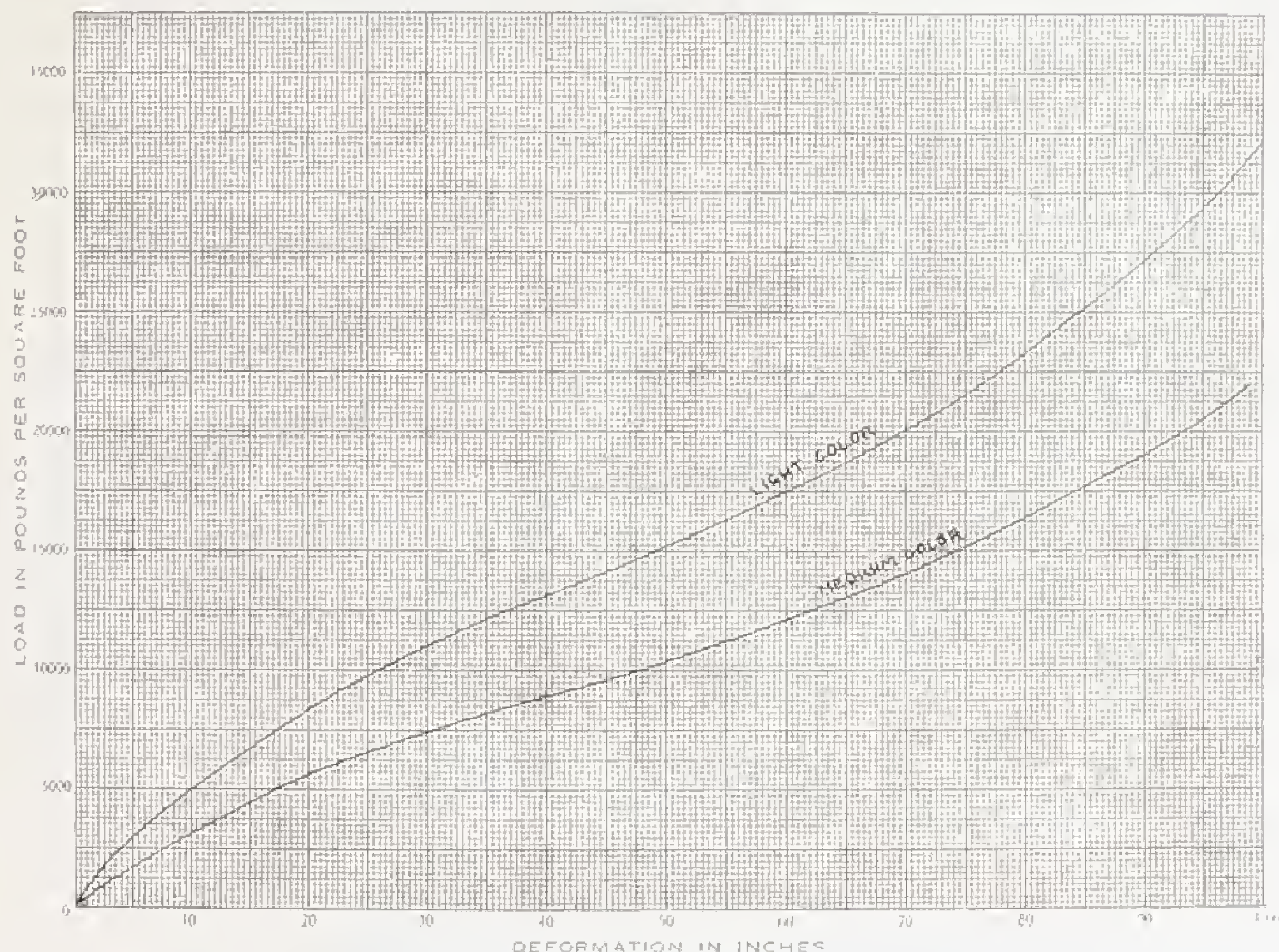
Data Needed

The density, color and thickness of Nonpareil Cork Machinery Isolation to be used cannot be determined accurately until such factors as the *weight*, *speed* and *character* of the machine to be isolated are known. Generally speaking, however, it may be said that the grades which should be used under different classes of machines are as follows:

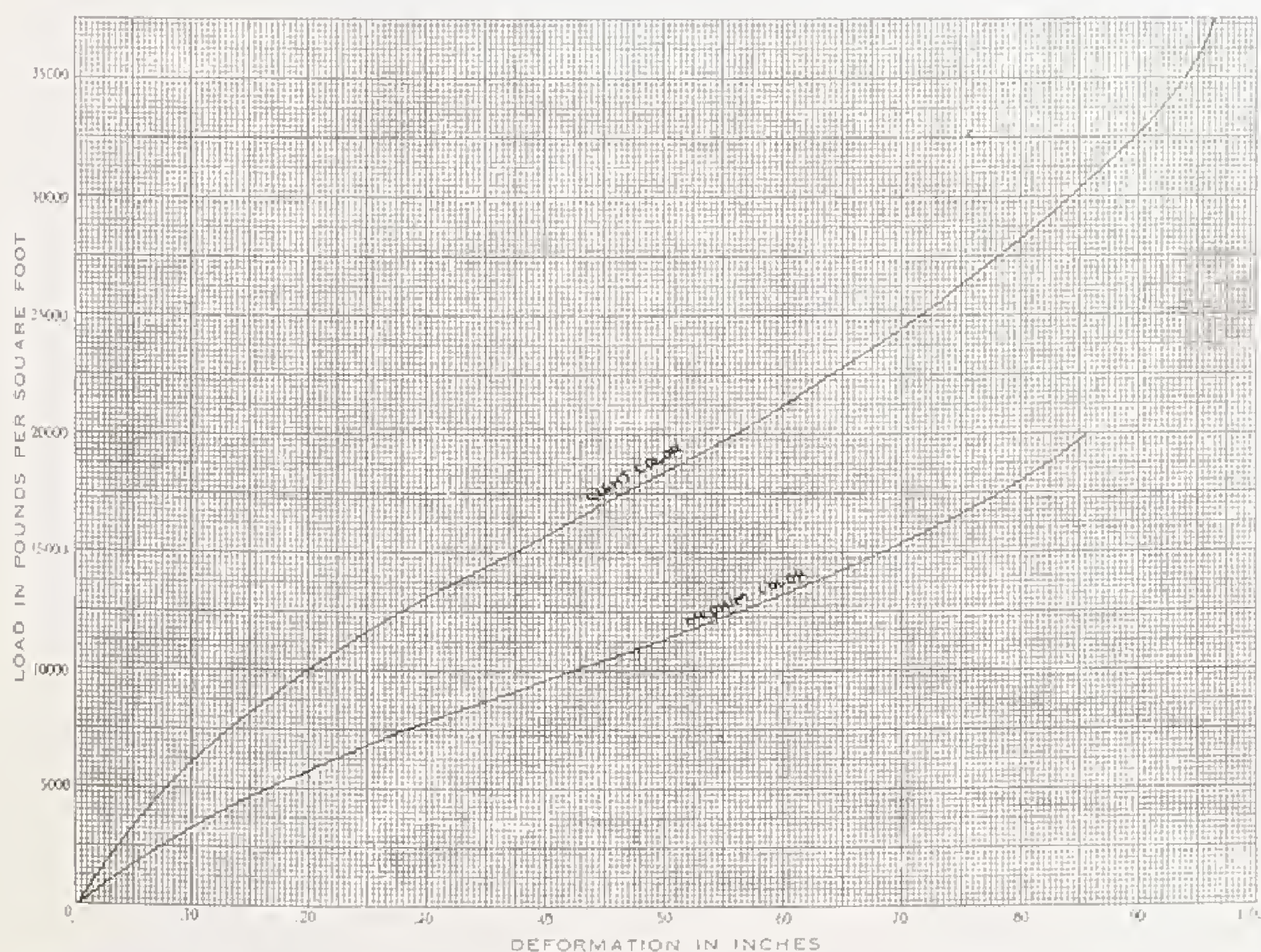
Class of Machine	Density of Nonpareil Cork, in lbs. per board foot
Small fans, motors, generators, etc.	1.10 to 1.20
Large fans, medium size motors and generators, light machines and machine tools, etc.	1.25 to 1.33
Heavy motors and generators, large machines and machine tools, engines, etc.	1.50 to 1.66

NOTE: The proper color to use cannot be given until the facts mentioned above are known.

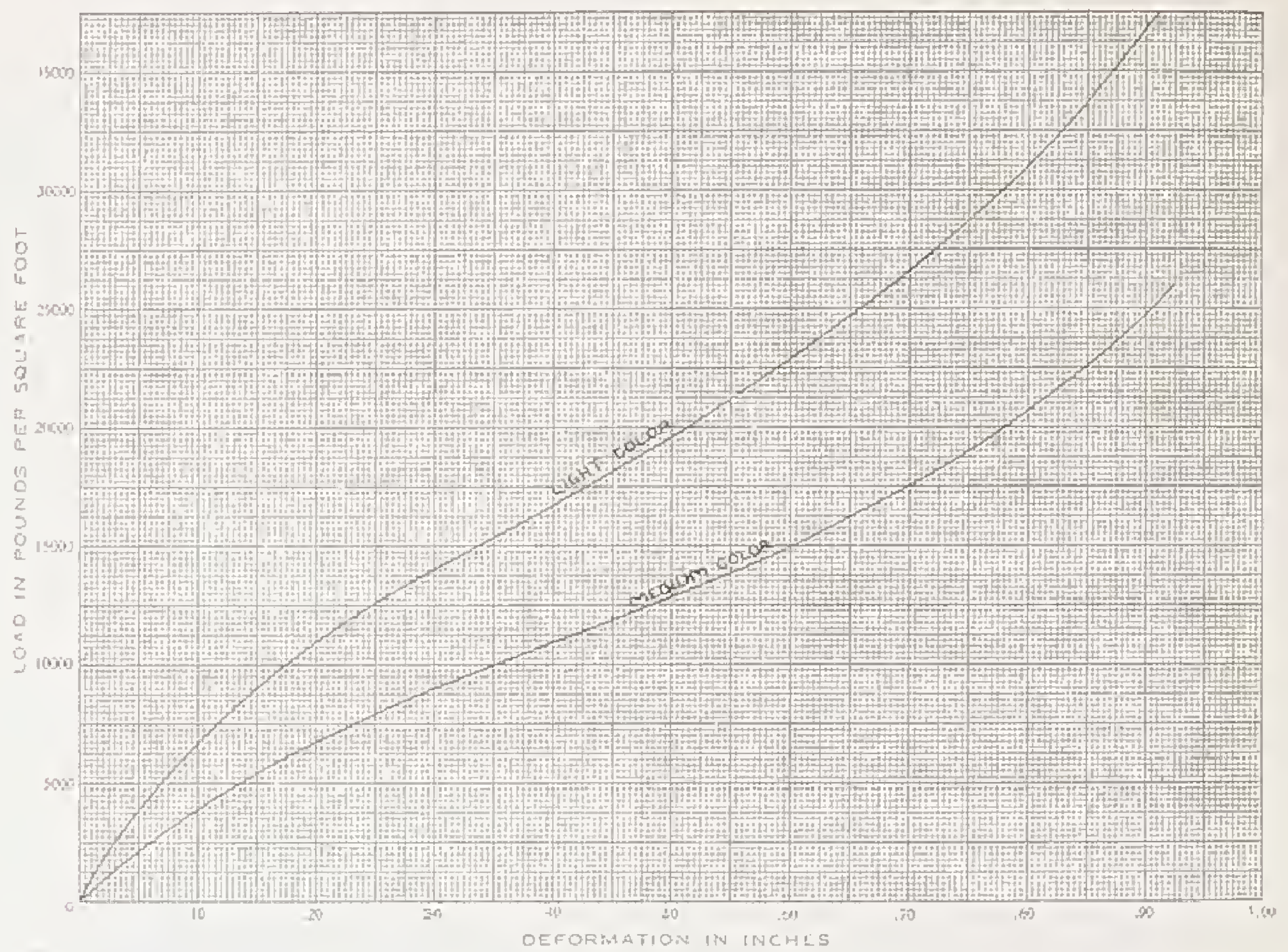
The following charts, showing the deformation at different loads of the various densities and colors of Nonpareil Cork Machinery Isolation, two inches thick, will be of assistance in selecting the proper grade of material to use :



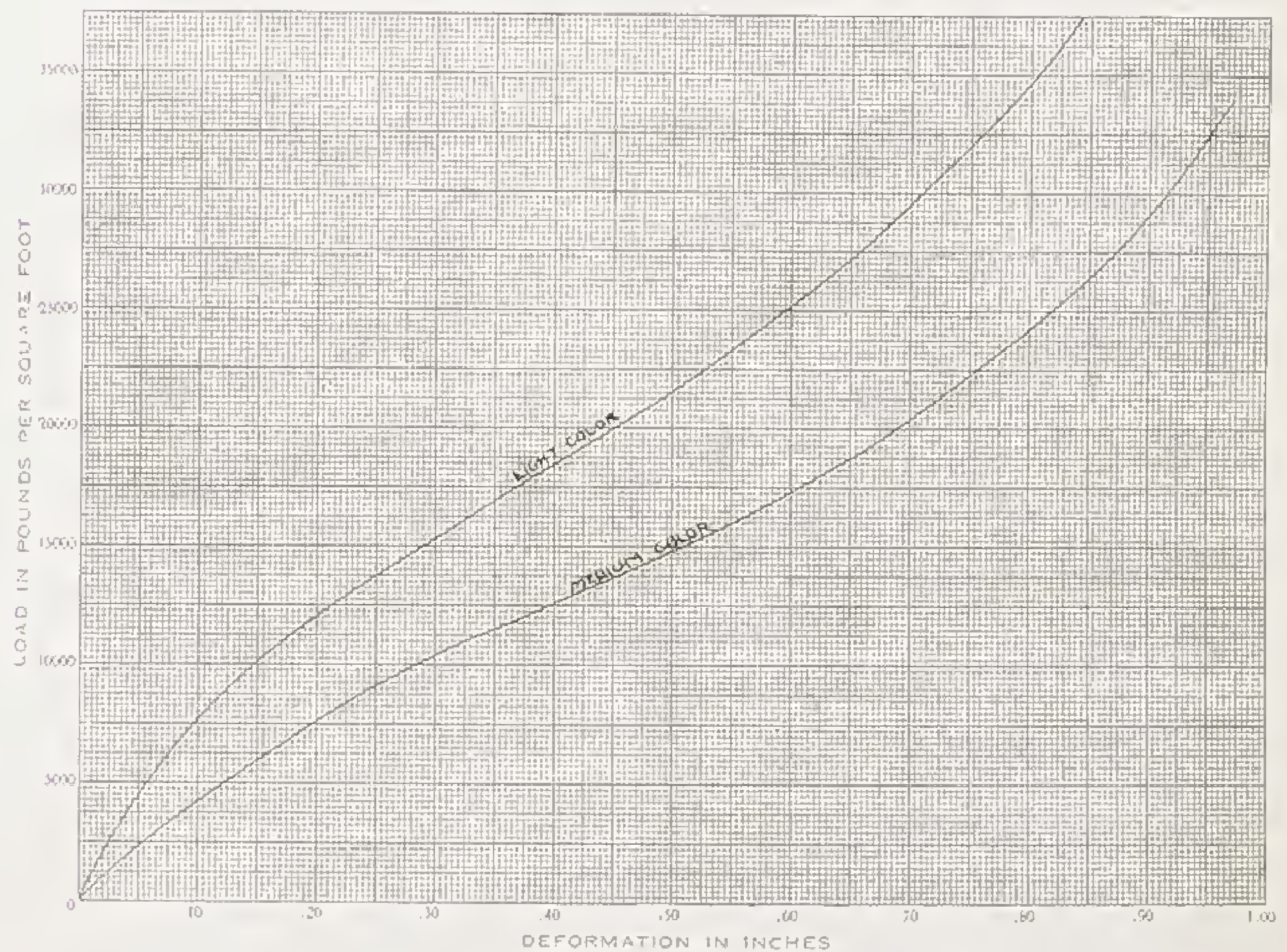
Compression Tests on Nonpareil Cork Machinery Isolation—1.10 pounds density, light and medium colors, 2 inches thick



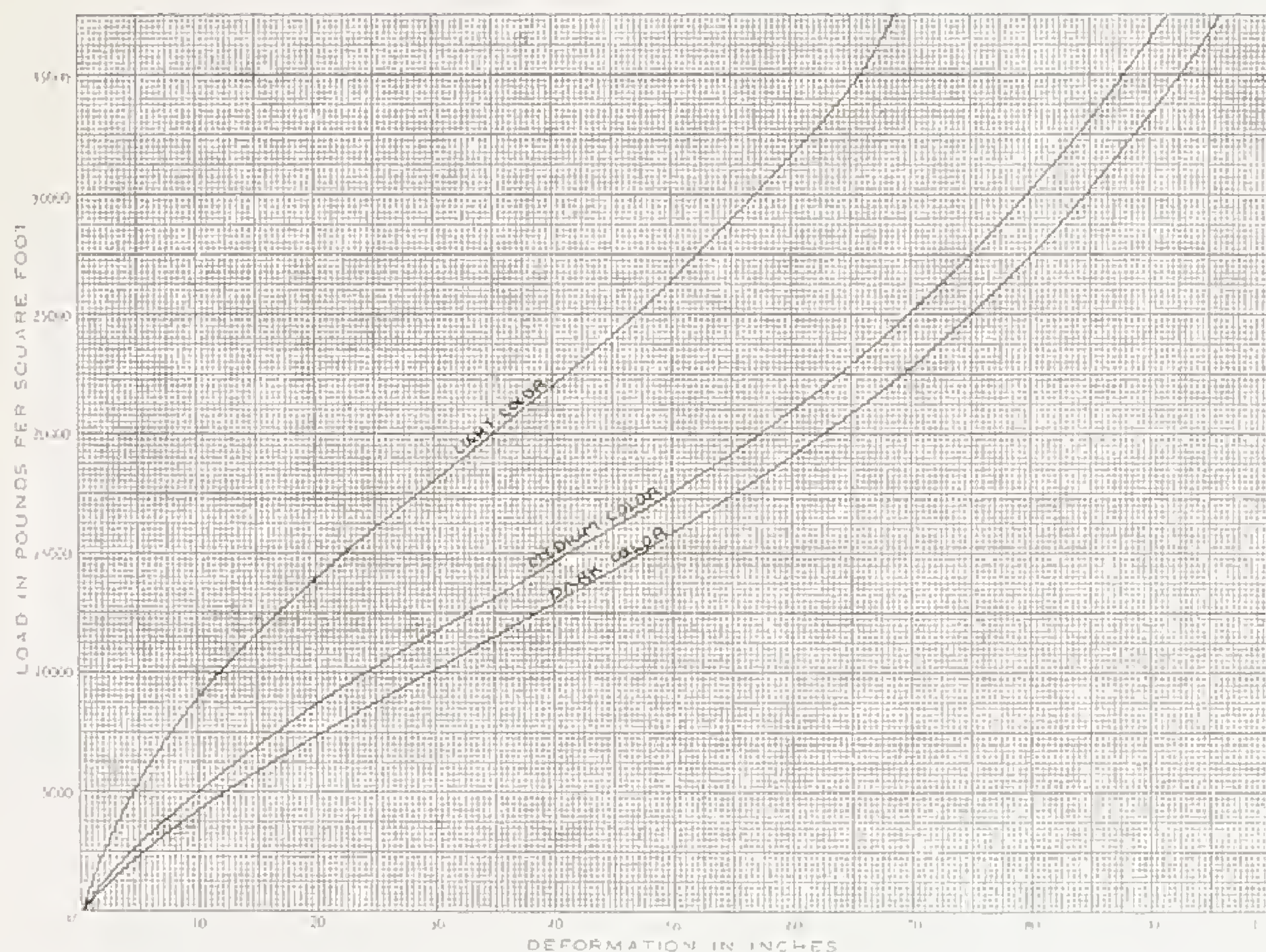
Compression Tests on Nonpareil Cork Machinery Isolation—1.20 pounds density, light and medium colors, 2 inches thick



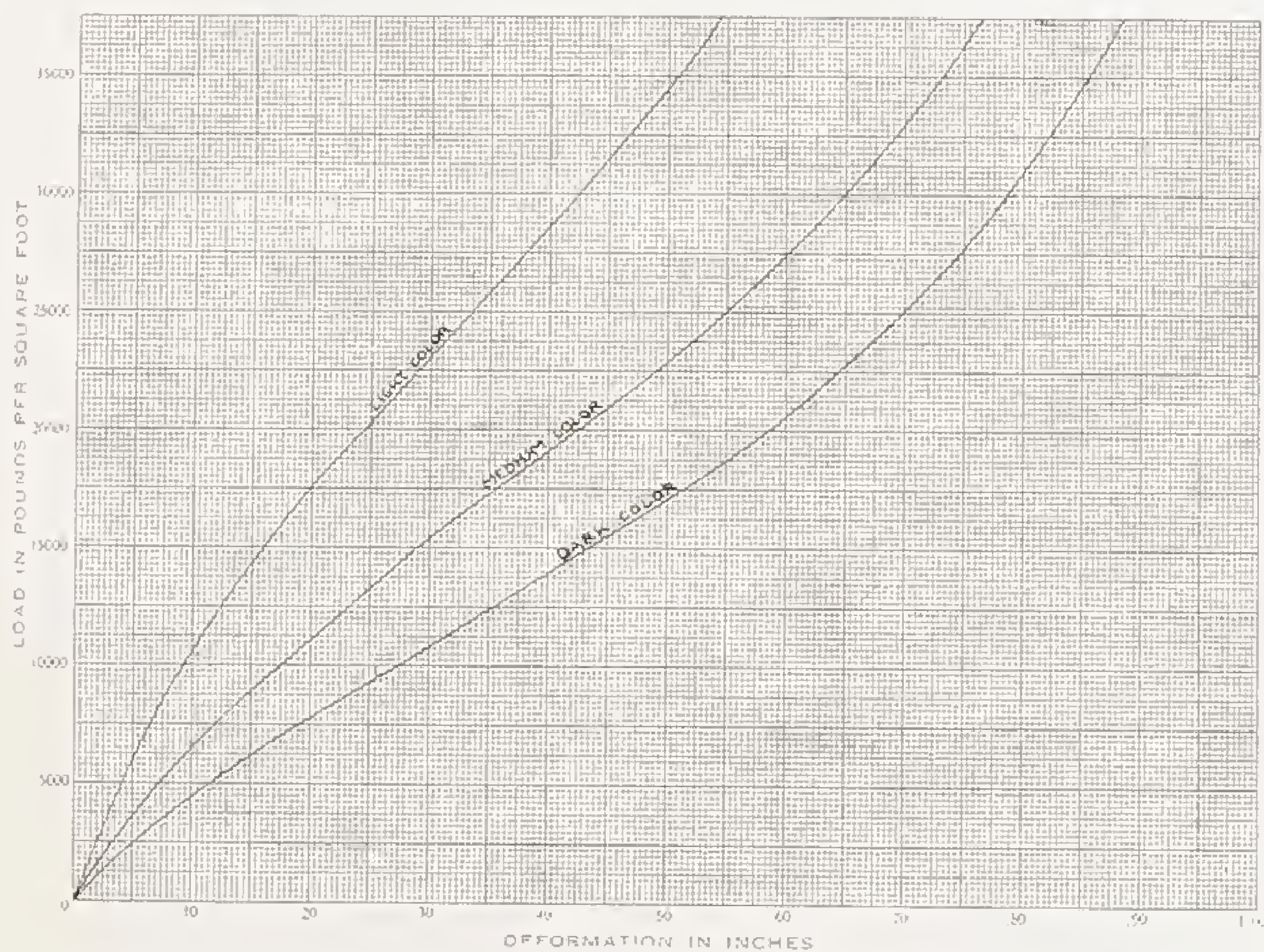
Compression Tests on Nonpareil Cork Machinery Isolation—1.25 pounds density, light and medium colors, 2 inches thick



Compression Tests on Nonpareil Cork Machinery Isolation—1.33 pounds density, light and medium colors, 2 inches thick



Compression Tests on Nonpareil Cork Machinery Isolation—1.50 pounds density, light, medium and dark colors, 2 inches thick



Compression Tests on Nonpareil Cork Machinery Isolation—1.66 pounds density, light, medium and dark colors, 2 inches thick

Methods of Installing

Two General Methods

Two general methods of installing Nonpareil Cork Machinery Isolation are usually followed. In the first method the foundation pits are finished with concrete and lined with Nonpareil Cork Machinery Isolation on the bottom and sides. The foundation proper is then poured in on top of the Nonpareil Cork, which should be protected with suitable waterproof insulating paper. In the second, the cork is placed between the base of the machine and the foundation, floor or ceiling to which it is fastened.

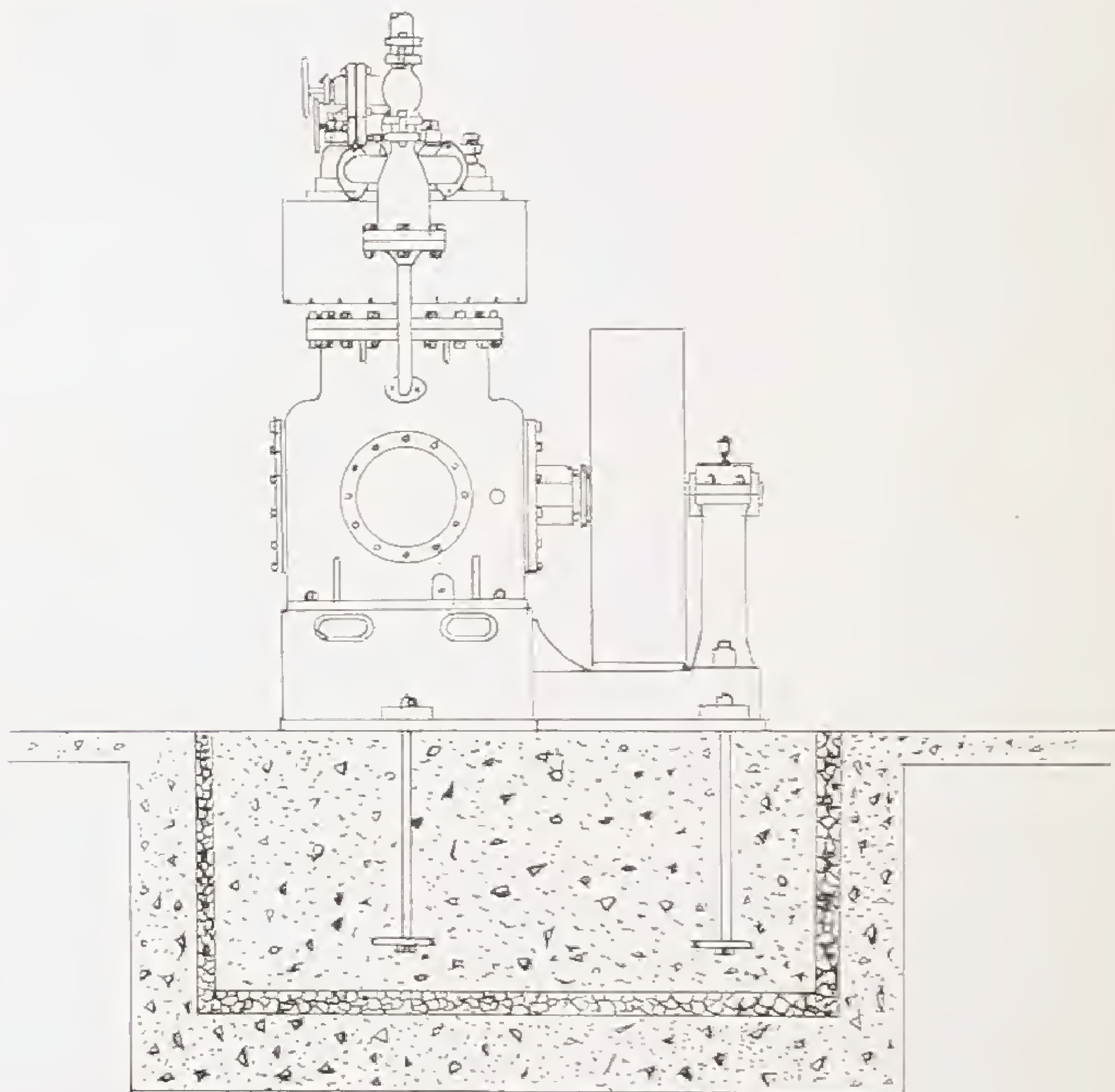
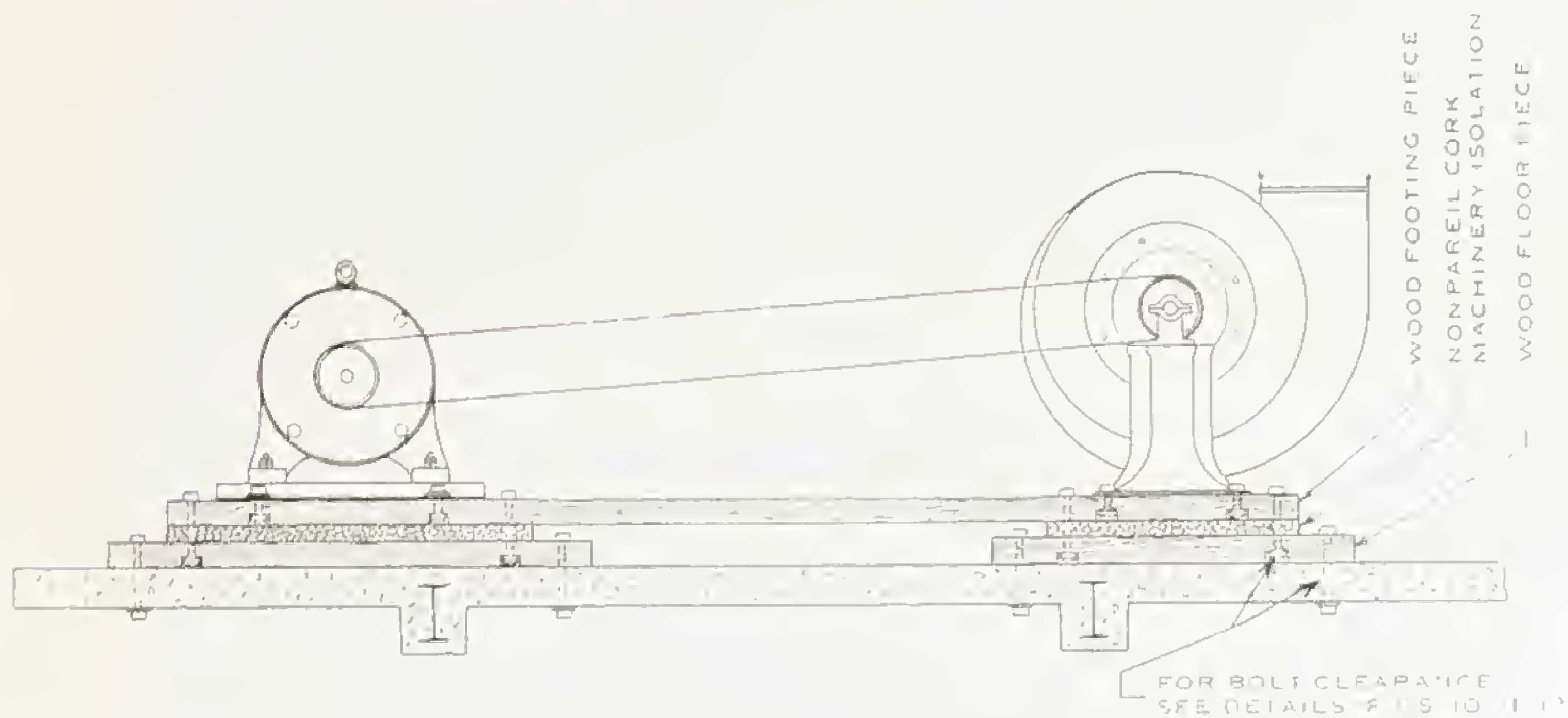


FIG. 1. Method of isolating machinery foundations with Nonpareil Cork Machinery Isolation

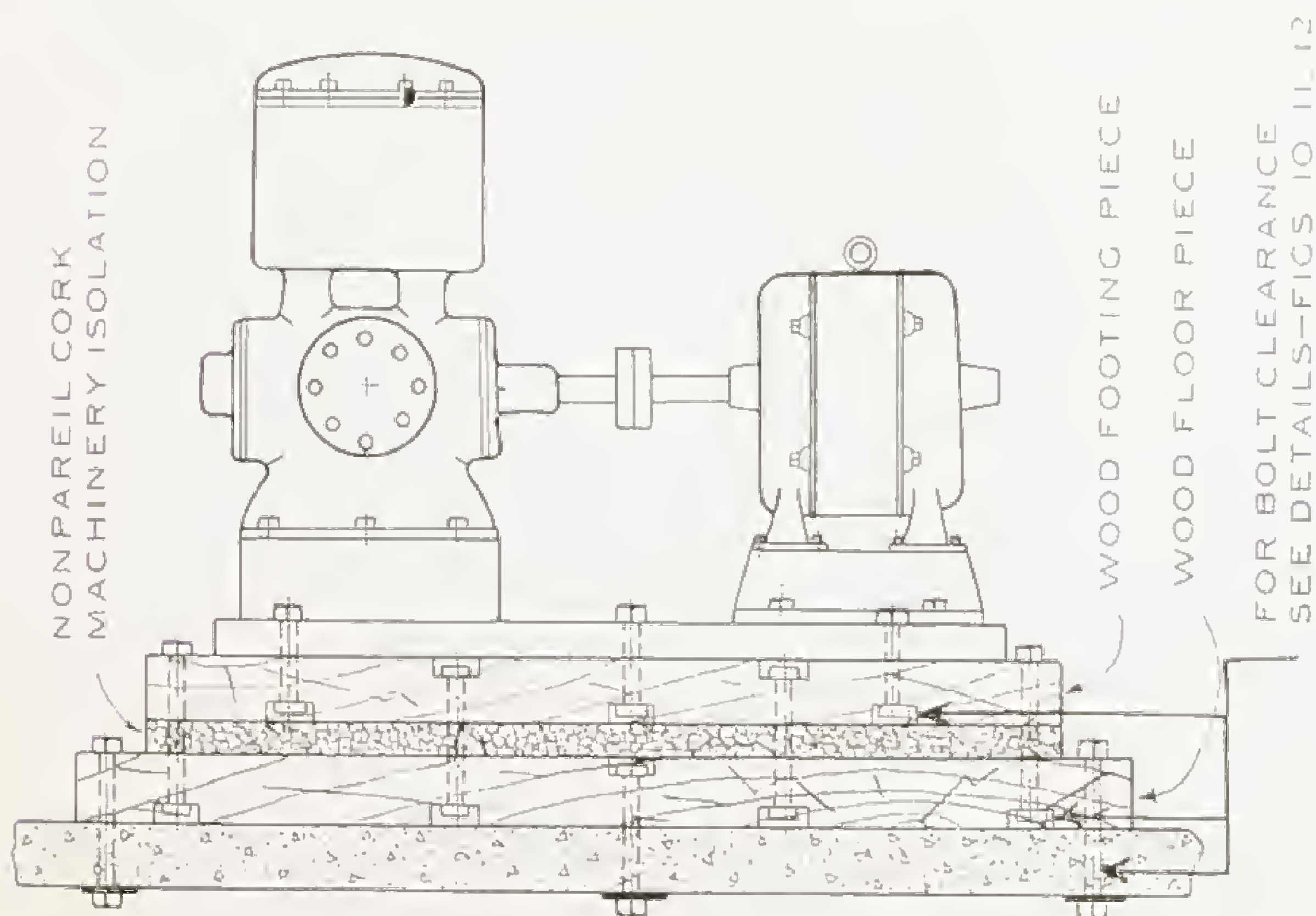
On the pages following will be found a number of drawings showing various ways of utilizing Nonpareil Cork Machinery Isolation. In all cases Nonpareil Cork Machinery Isolation should be covered with light telescoping metal pans to protect it from abrasion. This is also an effective means of shielding it from oil, certain kinds of which are liable to cause disintegration in time.

Fig. 2. Two or more units not on the same bed plate—wood or concrete floors and ceilings.



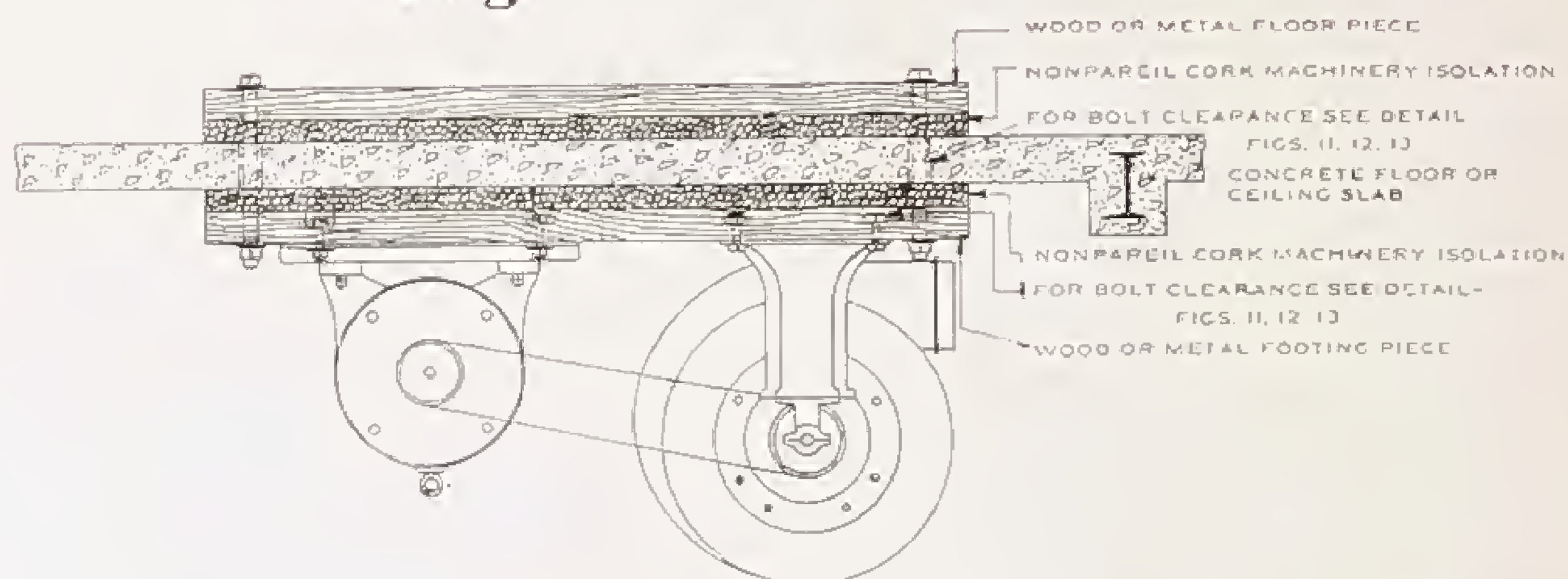
For fireproof method, see Figs. 7, 8, 12 and 13

Fig. 3. Two or more units on the same bed plate—wood or concrete floors and ceilings.



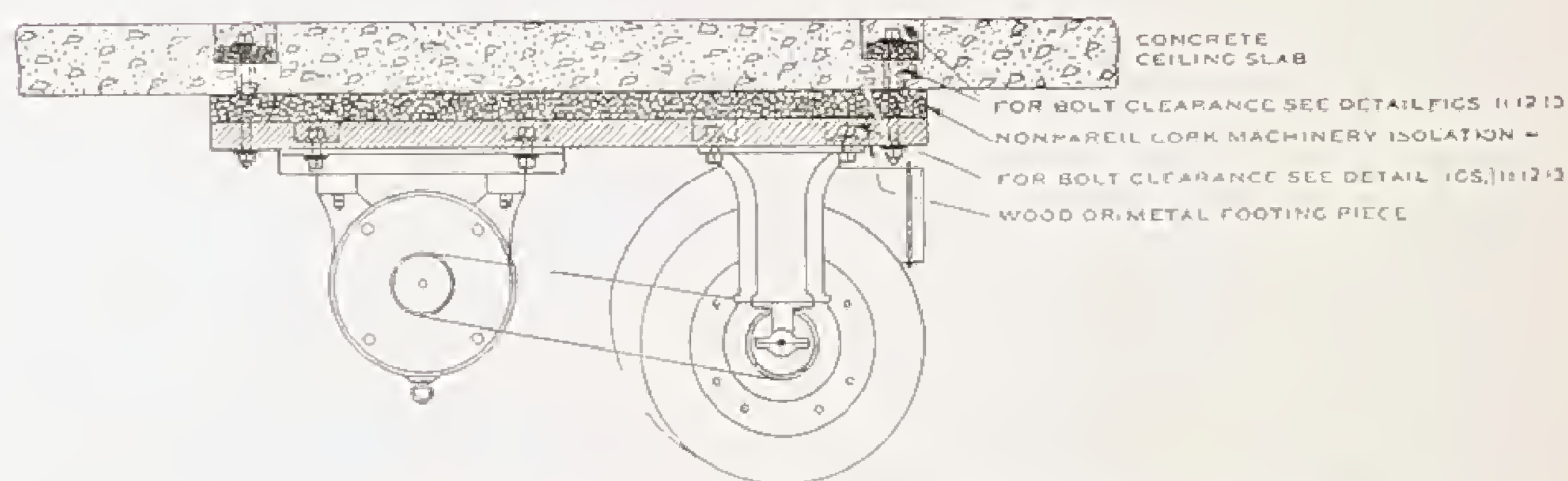
For fireproof method, see Figs. 7, 8, 12 and 13

Fig. 4. Two or more units on the same bed plate—wood or concrete floors and ceilings.



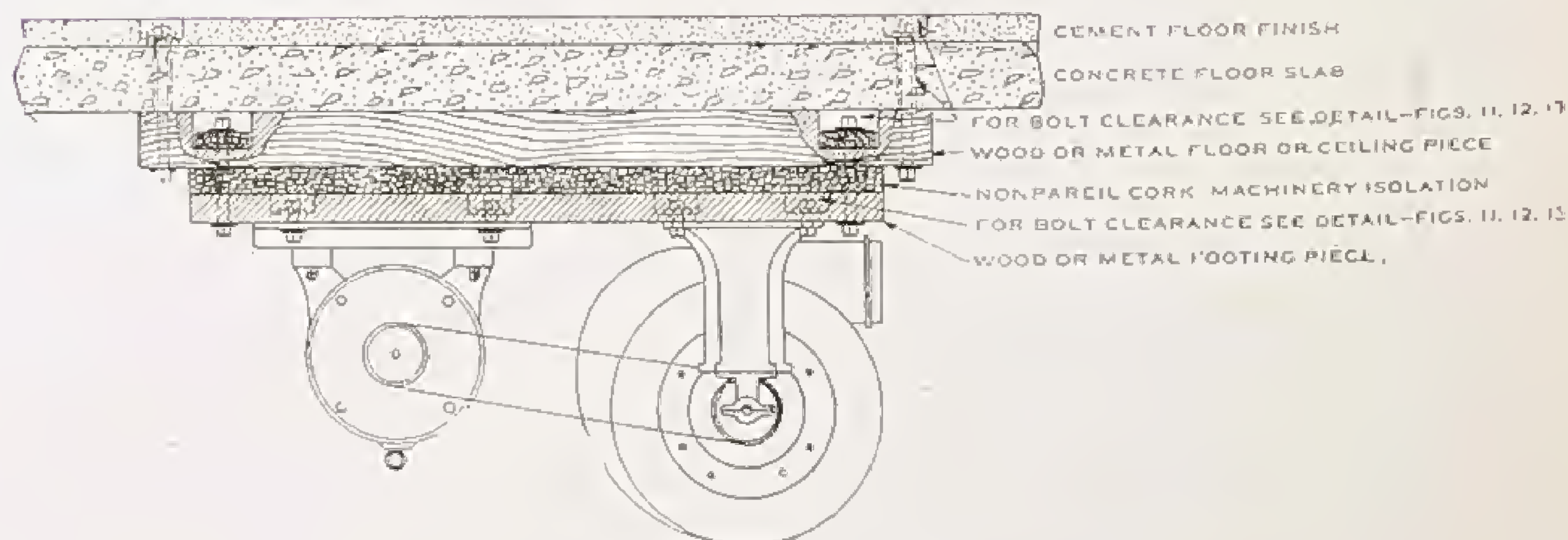
This method can be used only when it does not offer an obstruction on the opposite side of the floor or ceiling to which the machinery is bolted

Fig. 5. Two or more units on the same bed plate—wood or concrete floors and ceilings.



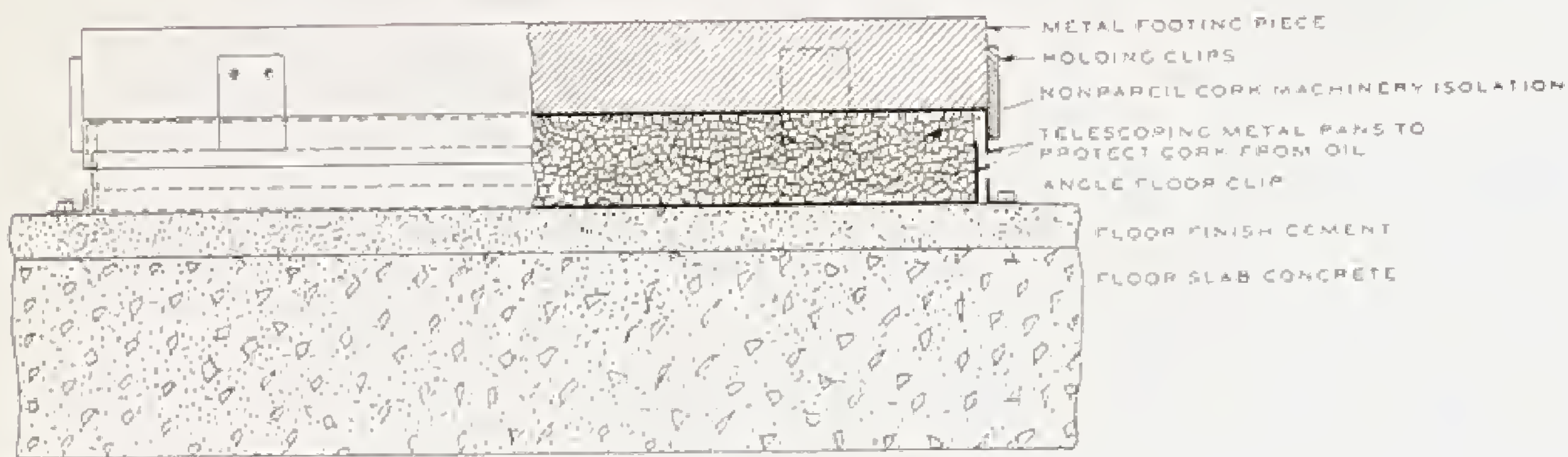
This is a good method to follow when the thickness of the floors or ceilings permits of pocketing and cushioning the bolt heads.
For fireproof method, see Figs. 7, 8, 12 and 13.

Fig. 6. Two or more units on the same bed plate—wood or concrete floors and ceilings.



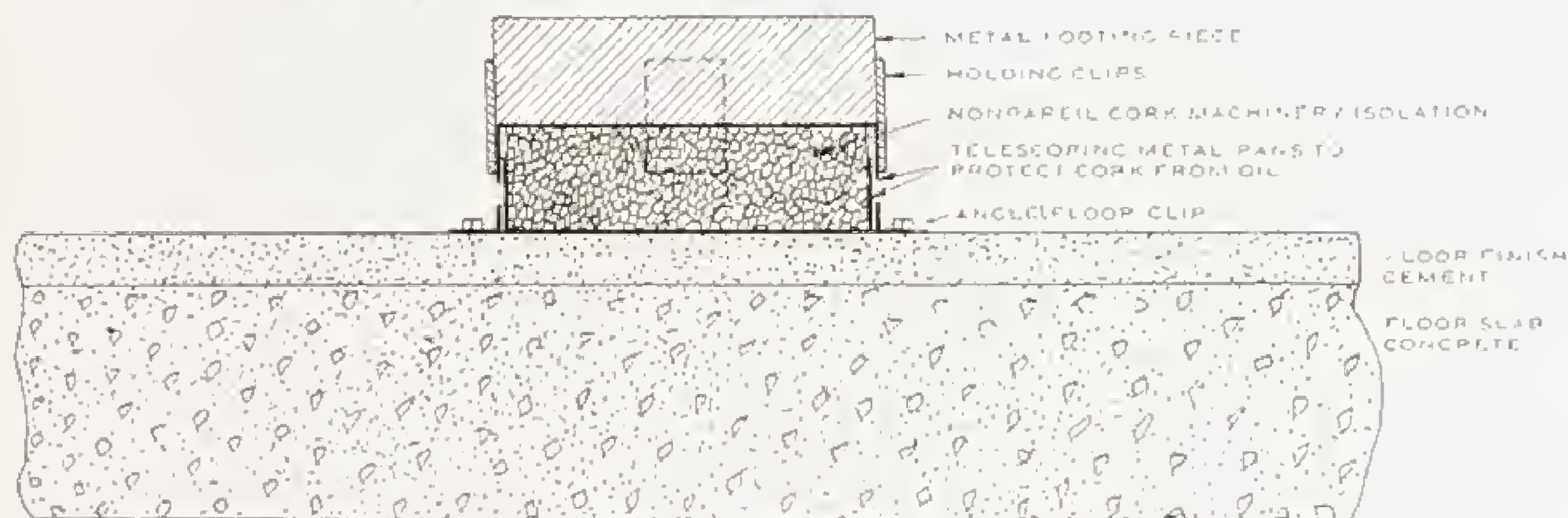
A good method to follow when it is not possible to use the methods shown by Figs. 4 and 5

Fig. 7. Details of fireproof method—concrete floors.



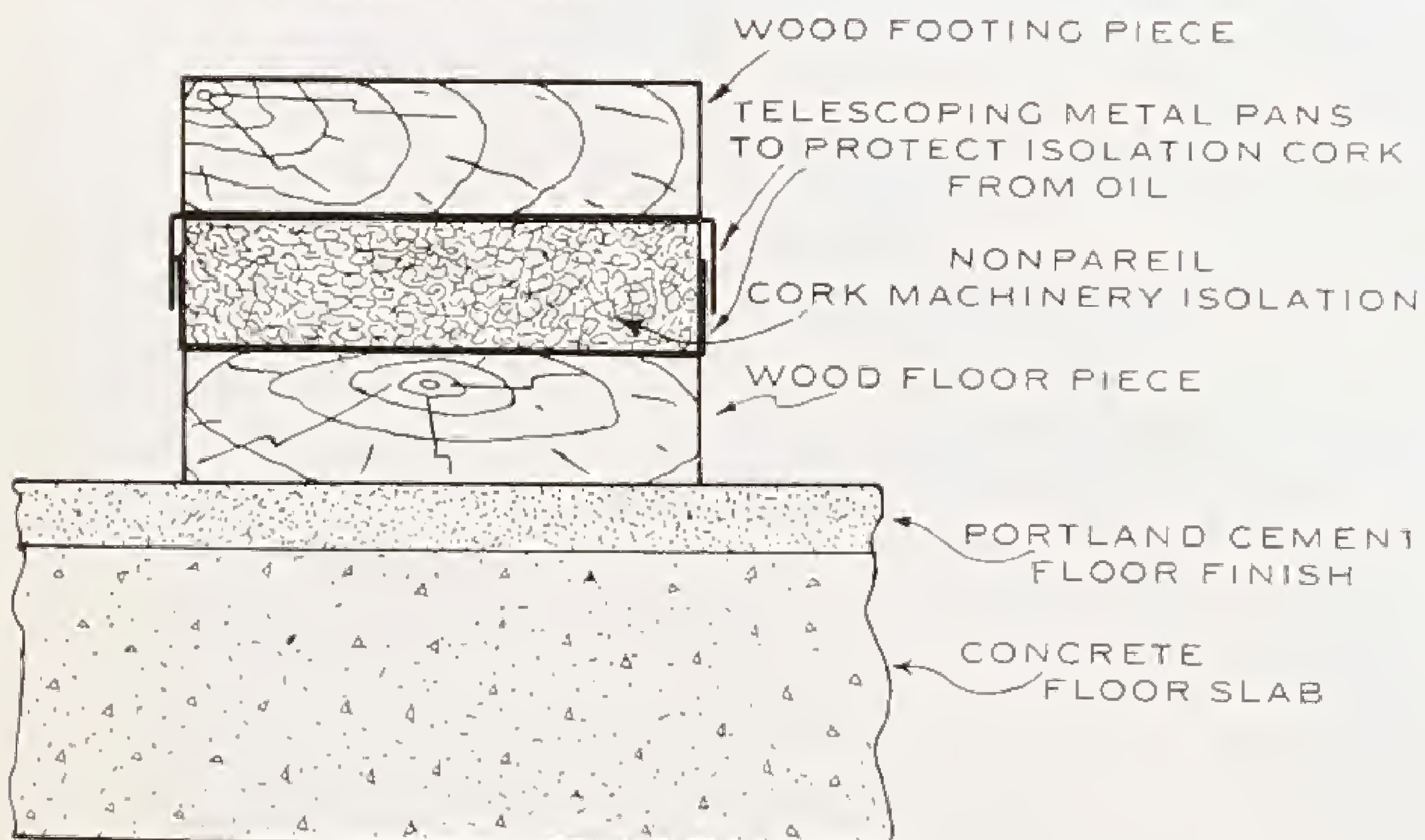
Side elevation and section

Fig. 8. Details of fireproof method—concrete floors.



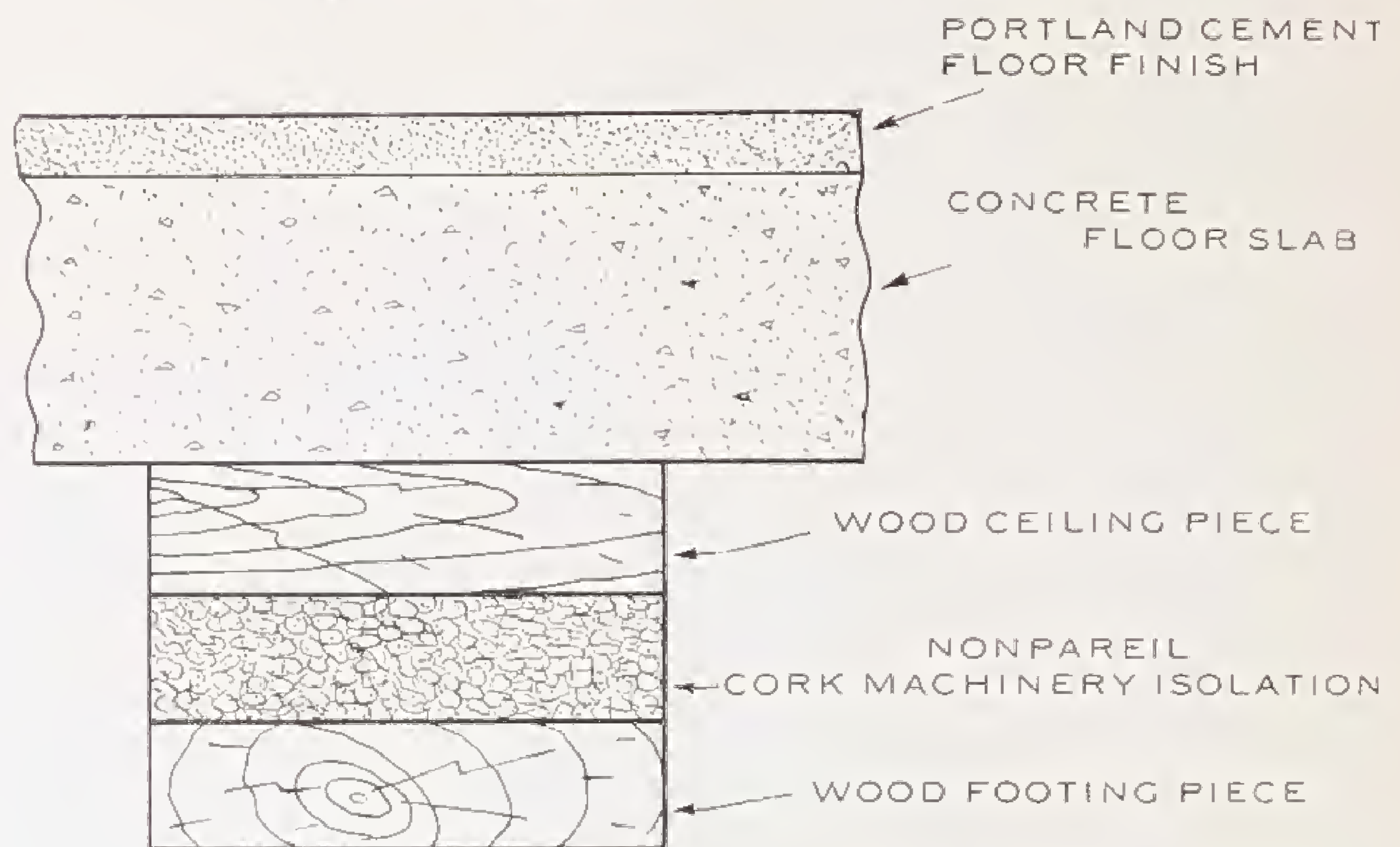
Cross section

Fig. 9. Details of non-fireproof method—concrete floors.



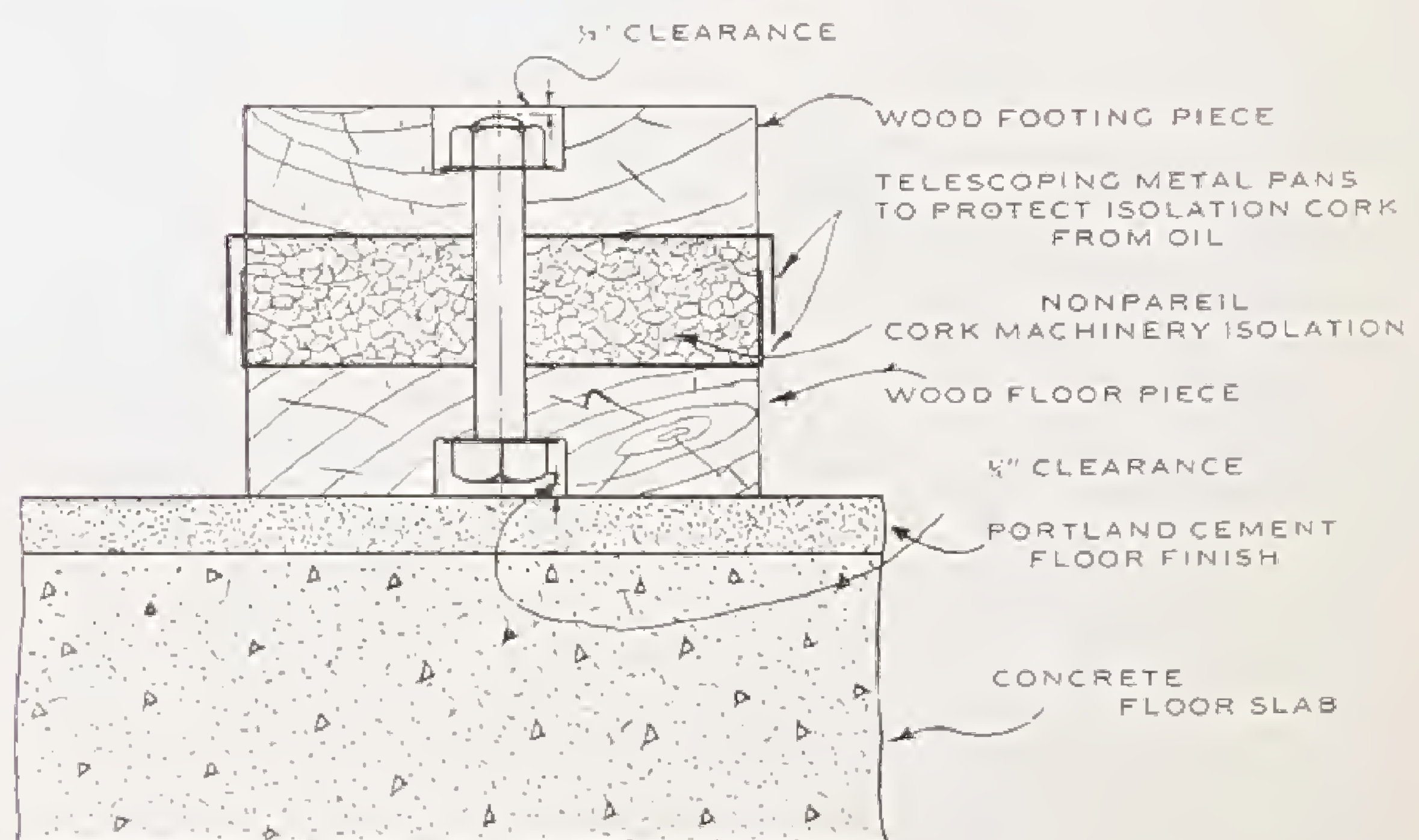
Cross section for fireproof method, see Figs. 7, 8, 12 and 13

Fig. 10. Details of non-fireproof method—
wood or concrete ceilings



Cross section for fireproof method, see Figs. 7, 8, 12 and 13

Fig. 11. Details of method of setting bolts to
give necessary clearance.



Cross section for fireproof method, see Figs. 7, 8, 12 and 13

Fig. 12. Details of fireproof method—
concrete floors.

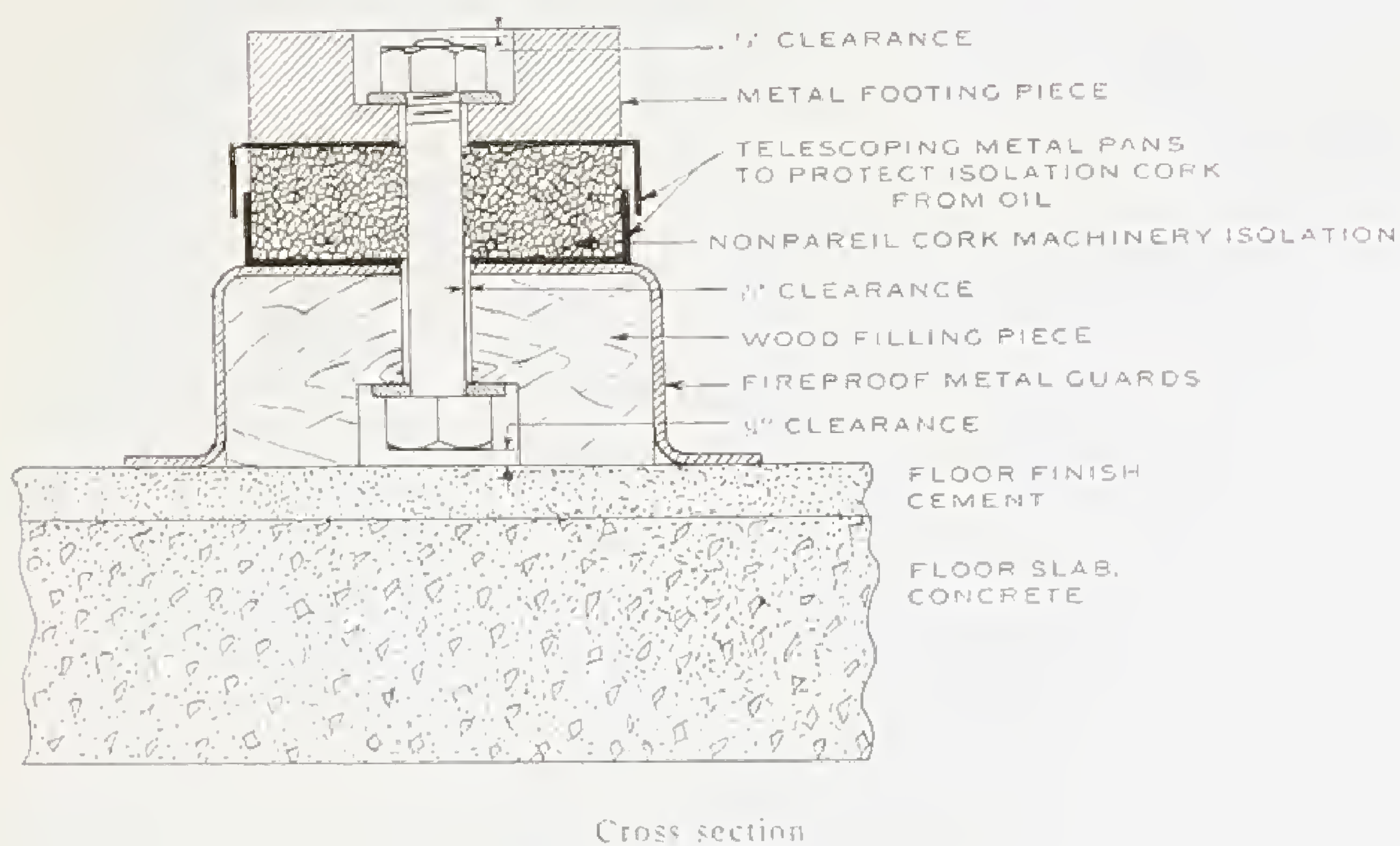
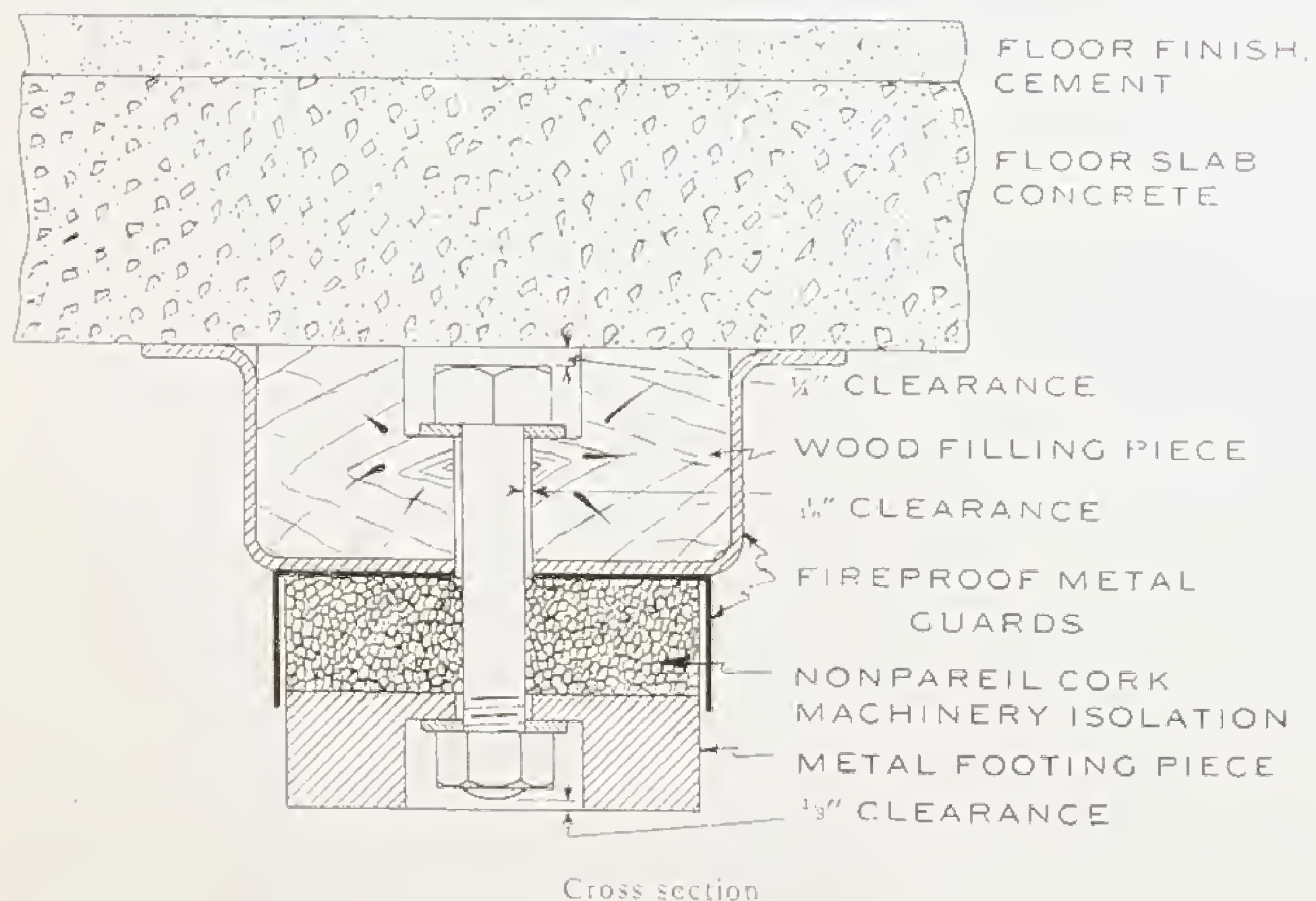


Fig. 13. Details of fireproof method—
concrete ceilings.



Prices and Samples

Prices and samples of Nonpareil Cork Machinery Isolation, and engineering assistance covering any specific case, will be cheerfully supplied on request.

Other Products

Among the other products supplied by the Armstrong Cork & Insulation Company are :

Nonpareil Insulating Brick—For reducing the loss of heat from boiler settings, steam drums, industrial furnaces and ovens, kilns, blast furnace stoves, hot blast mains, bake ovens, etc.

Nonpareil High Pressure Covering—For high pressure and superheated steam lines, feed water heaters, boilers, tanks and heated surfaces generally.

Nonpareil Corkboard Insulation—For the insulation of cold storage rooms in refrigerating plants, creameries, dairies, breweries, packing plants, etc.

Nonpareil Cork Covering—For the insulation of brine, ammonia and ice water lines, drinking water systems, and cold pipes and tanks generally.

Armstrong Circle A Cork Brick—For flooring cold storage rooms, plating rooms, cow stalls, piggeries, etc.

Linotile—For floors in offices, residences, public and semi-public buildings.

Samples and full information regarding any of the above products will be cheerfully supplied on request.

Armstrong Cork & Insulation Company

Pittsburgh, Pa.

Branches in the Principal Cities

